AN INVESTIGATION INTO FACTORS THAT PREDICT HEALTH-RELATED QUALITY OF LIFE IN ADOLESCENTS WITH INFLAMMATORY BOWEL DISEASE

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DECLARATION

I, Fionnuala Scullion, declare that this thesis was written by me and that I conducted the work detailed herein. This work has not been submitted for, or accepted in, any other previous degree.

Fionnuala Scullion
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ABSTRACT

Objectives: The main aim of this research was to investigate factors which predict Health-Related Quality of Life (HRQOL) in adolescents with Inflammatory Bowel Disease (IBD). A secondary aim was to investigate agreement between parent reported and adolescent reported HRQOL. A further aim was to investigate gender differences in reported HRQOL.

Method: Fifty-seven adolescents with IBD attending a Gastroenterology outpatients' clinic completed measures of anxiety (Spence Children's Anxiety Scale), depression (Beck Depression Inventory), self esteem (Rosenberg Self Esteem Scale), parental overprotection (Parental Bonding Instrument) and HRQOL (Pediatric Quality of Life Inventory -PedQL). Parents completed measures of anxiety (Beck Anxiety Inventory), depression (Beck Depression Inventory) and the parent version of the PedsQL.

Results: Adolescent and parental psycho-social functioning and maternal overprotection were found to be significantly associated with HRQOL outcomes. Regression analysis indicated that gender, individual psychological functioning and parental functioning as a whole predicted HRQOL outcomes. Agreement on parent and self reported HRQOL was moderate to good across all domains. Females reported poorer HRQOL than males on domains of physical, social and psycho-social functioning.

Conclusions: This study highlights the influence of individual and parental factors on the quality of life of adolescents with IBD. Clinical and theoretical implications of these findings are discussed.

1: INTRODUCTION

1.1 Background

1.1.1 Inflammatory Bowel Disease

Inflammatory bowel disease (IBD) is a chronic medical condition which affects normative functioning of the gastrointestinal system. IBD is the collective term for three chronic, organic conditions of the gastrointestinal tract, ulcerative colitis (UC), Crohn's disease (CD) and indeterminate colitis (ID) (De Boer *et al*, 2005; Levenstein, 2002). IBD is characterised by inflammation or ulceration of the gastrointestinal tract and affects both adults and children. Around 15-20% of cases occur before the age of 20 with a peak age of onset at 13 years (Sawczenko *et al.*, 2001). The incidence rate for IBD in Scotland in 2001 was estimated at around 6.5/100,000 which was twice the estimated incidence reported in 1983 (3.9/100,000) (Sawczenko *et al.*, 2001). Furthermore, Sawczenko and colleagues reported that Scotland currently has a higher incidence rate than the remainder of the UK and the Republic of Ireland (5.5/100,000). Differences have also been found in incidence of childhood onset CD in northern and southern Scotland, with northern areas of Scotland having significantly higher incidence rates of CD than their southern counterparts (Armitage *et al.*, 2004).

IBD results in a range of symptoms including, frequent and chronic diarrhoea, rectal bleeding, abdominal pain, fatigue and weight loss. IBD has a remitting course and will often result in hospital admission. In the longer term, IBD has also been linked with growth deficiencies such as short stature, delayed puberty and impaired motor functioning (Banez & Cunningham, 2003; Blank & Switzer, 2006; Casati *et al.*, 2000; Crane & Martin, 2004; De Boer *et al.*, 2005; Levenstein, 2002; Mackner & Crandall, 2006; Otely *et al.*, 2006).

The symptoms of IBD can be particularly distressing in school aged children due to the increased or urgent need to use the toilet (Casati *et al.*, 2000). These children are often unable to participate in all activities at school due to the symptoms of IBD including abdominal pain and fatigue (Banez & Cunningham, 2003; Mackner &

Crandall, 2007). School avoidance or increased absenteeism is common (Akobeng *et al.*, 1999, Banez & Cunningham, 2003).

Ulcerative colitis is localised inflammation or ulceration in the inner colon area of the large intestine whereas Crohn's disease is characterised by inflammation or ulceration occurring in any part of the gastrointestinal tract and can be present throughout the thickness of the intestinal wall (Banez & Cunningham, 2003). Indeterminate colitis is the term affixed when a definitive diagnosis of ulcerative colitis or Crohn's disease is unclear but where there is clear evidence of inflammation or ulceration in the large intestine. The aetiology of IBD remains relatively unclear although it is believed to have a genetic link. More recent research has suggested onset of IBD may be related to immunodeficiency in the intestine area (Banez & Cunningham, 2003; Mackner *et al.*, 2004).

At present, there is no known cure for IBD and intervention is typically focused on long term management of symptoms. This includes the use of steroid medication to manage exacerbation of symptoms. In severe or complicated cases, or when medication has not been effective, the patient will be considered for surgical intervention. Surgery involves part or complete removal of the colon and rectum. This surgical procedure is called colectomy. In Crohn's disease, colectomy will not prevent reoccurrences of inflammation or ulceration in other parts of the gastrointestinal tract (Banez & Cunningham, 2003). Around a third of patients with an early diagnosis of IBD will undergo surgical intervention in their lifetime (Langholz *et al.*, 2000).

Removal of all or part of the colon necessitates the creation of an artificial opening known as a colostomy. Faecal matter is redirected from the rectum via the colostomy to a small pouch. This stoma or colostomy bag is emptied and maintained by the individual. Colostomy is often reversible, by the surgical creation of an internal pouch using part of the small intestine, however this is usually completed as a further operation, following colectomy (Banez & Cunningham, 2003).

Although medical and surgical interventions can alleviate the symptoms of IBD there are significant side effects and implications of these interventions which can be distressing for patients. Steroid medication can lead to fluctuating weight, growth deficiencies, acne and cushingoid features. These side effects have been associated with increased anxiety, low mood and impaired body image, particularly in adolescence (Drigan *et al.*, 1992; Mackner *et al.*, 2004). Often adolescents will discontinue steroid use or try to cope with painful exacerbation of symptoms without treatment due to these aversive side effects (Drigan *et al.*, 1992). Furthermore, patients will often take medication until the physical symptoms alleviate then discontinue use earlier than advised in an attempt to reduce negative side effects thus, in turn, increasing the chances of relapse (Banez & Cunningham, 2003). Difficulty with adherence to treatment is therefore a common problem in adolescence as the side effects of steroid medication are often perceived as worse than disease symptoms.

Undergoing major surgery for treatment of IBD is recognised as particularly stressful (Drossman *et al.*, 1989). Surgical interventions are associated with increased pain, lengthy hospital admissions and increased risk of complications. Although removal of the colon can be curative, using a stoma bag can be a further source of stress. Stoma bag use is associated with higher levels of anxiety and impaired body image in both adults and young people (Akobeng *et al.*, 1999; Drossman *et al.*, 1989). Conversely, there has been some suggestion that surgical interventions can increase health-related quality of life (HRQOL) and result in functional improvement in both the adult and paediatric population (Chew *et al.*, 2003). This improvement is believed to be due to the alleviation of IBD symptoms following surgical intervention although it was noted that the study by Chew and colleagues was a retrospective analysis with very small sample sizes in both the adult (N=16) and paediatric (N=16) samples. A study by Akobeng and colleagues (1999) suggested that young people recognise the benefits of surgery in regard to symptoms but still find using a stoma bag a source of stress (Akobeng *et al.*, 1999).

Summary

IBD is a chronic medical condition with a peak onset in adolescence. Diagnosis of IBD involves invasive medical procedures which can be distressing for patients. Symptoms of IBD can also have a significant impact on psychological functioning. In adolescence, IBD has been linked with school avoidance, absenteeism and delayed puberty. Medical intervention for IBD often involves the use of steroid medication which can result in side effects such as weight gain, acne and altered facial features. Adherence to medication can be a problem, particularly in adolescence. Although surgical interventions can be curative, some procedures result in the need for a stoma bag, which can have a negative impact on daily functioning and body image.

1.2 Adolescence

As discussed above, adolescents with IBD can face multiple difficulties coping with the manifestation of their conditions. The following section looks at the developmental context of adolescence and explores why patients with chronic conditions such as IBD have significant difficulty navigating through this complex, transitional life stage.

Adolescence represents a time of transition from childhood to adolescence and from adolescence to adulthood (Holmbeck *et al.*, 2000). This transition is characterised by some of the most significant physiological, psychological and social role changes experienced throughout the lifespan (Feldman & Elliot, 1990; Holmbeck & Kendall, 2002). Many of the risk factors associated with the development of chronic medical conditions such as diabetes, heart disease and cancer are largely behavioural in nature e.g. smoking, drinking, reduced exercise and poor diet (Williams *et al.*, 2002). These behaviours most often emerge in adolescence which is thus seen as a critical period in terms of early intervention strategies for the prevention of chronic health conditions (Williams, 2002).

Adolescence is also seen as critical in terms of the development of positive health behaviours such as physical activity and dietary choices in young people with chronic conditions and their peers. As Holmbeck (2002) considers, the adolescent's

"...developmental and health trajectories can be altered dramatically in positive or negative directions..." (Holmbeck, 2002, p.409). Holmbeck (2002) postulated that an understanding of the unique developmental context within which adolescence lies is crucial when attempting to understand adolescent health behaviours (Holmbeck, 2002). In order to enhance our understanding of adolescence, Holmbeck and Shapera (1999) developed a framework (see Figure 1) which illustrates the interaction between primary developmental changes, interpersonal factors, demographic factors and developmental outcomes which occur during this complex life stage (Holmbeck, 2002).

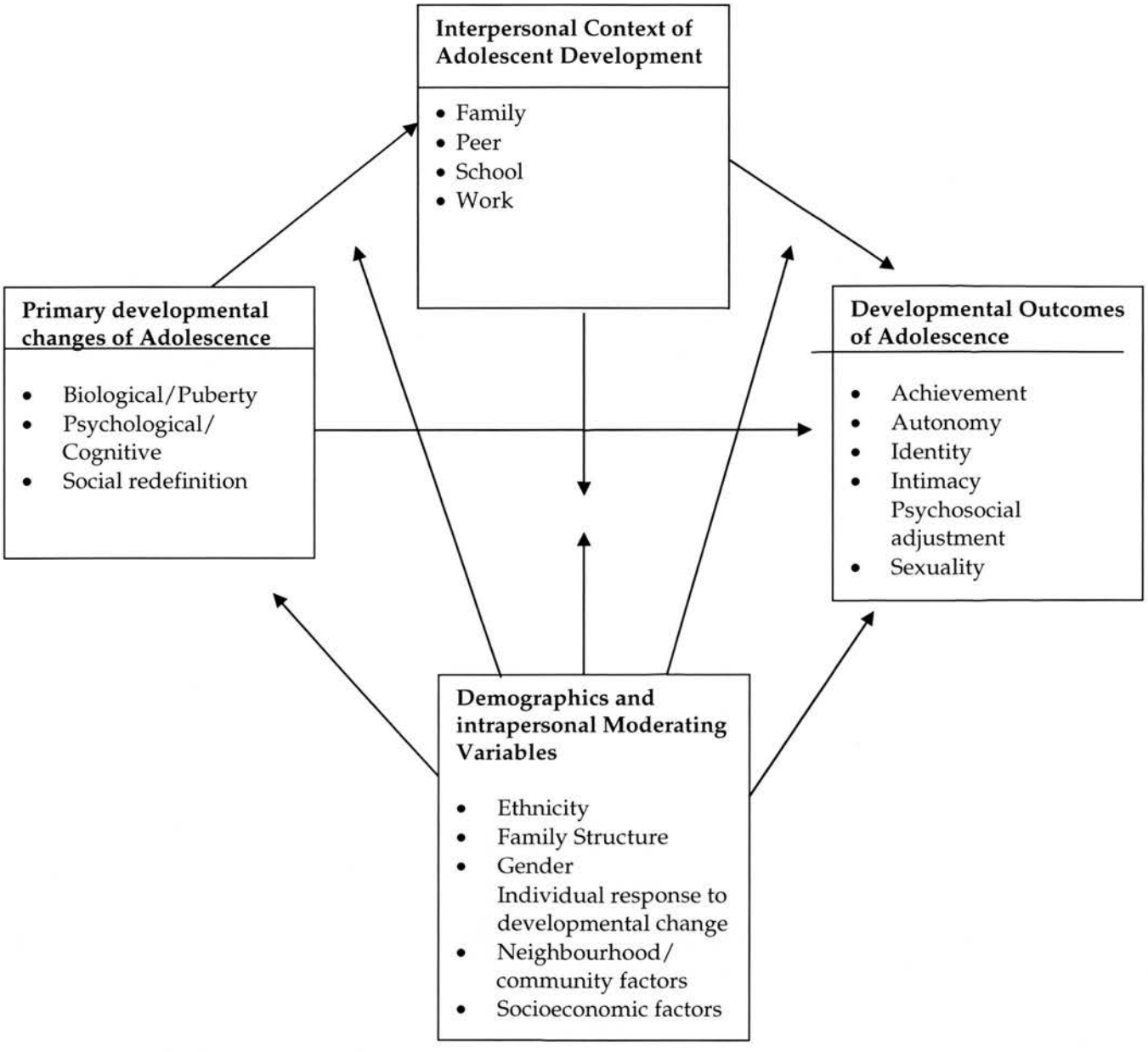

Figure 1: Framework for understanding adolescent development and adjustment (Holmbeck & Shapera, 1999).

In this framework, Holmbeck and Shapera suggest that adolescence is characterised by a combination of biological, psychosocial and cognitive changes which impact upon desired developmental outcomes. Resolution and attainment of these developmental outcomes such as autonomy, self identity and sexuality are crucial for successful transition into adulthood. Adolescents who have chronic health conditions can find that their illness or condition impacts on their capacity to resolve

these issues and this, in turn, affects health behaviours such as risk taking and adherence to treatment regimes (Holmbeck, 2002).

Due to the increased need to be accepted by their peer groups, adolescents may engage in activities that are perceived to be acceptable, for example, if their peer group engage in high risk behaviours such as drinking, smoking or drug taking, the adolescent is significantly more likely to also partake in these activities (Mosbach & Leventhal, 1988). Such risk taking behaviour can have even more significant consequences on the long term health of those with chronic medical conditions, both in terms of disease course and response to treatment regimes (Banez & Cunningham, 2003).

Adherence to treatment in adolescents with chronic medical conditions is poorer when treatment impacts on appearance or peer interactions (La Greca & Bearman, 2003). Adolescents may deviate from their treatment regime in order to 'fit in' with their peers or to avoid feeling or looking different (La Greca, 1990). In IBD, negative side effects of steroid medication include weight gain, acne and changes to facial appearance. Adolescents with IBD are at increased risk of non adherence to treatment due to these negative side effects and the perceived impact on peer acceptance (Banez & Cunningham, 2003).

Social role changes in adolescence are characterised by the desire for autonomy and peer approval (Holmbeck *et al.*, 2000). Peer approval is often linked with group identity, whereby the young adolescent attempts to be accepted by a peer group with whom they identify. Non-acceptance by a group will lead to feelings of isolation and alienation and can result in the young person lacking social support. Lack of a good social support network can affect health and well being (Holmbeck, 2002; Holmbeck *et al.*, 2000). As discussed, children and adolescents with gastrointestinal disorders are more likely to have increased school absences due to ill health thus reducing opportunities for affiliating to and maintaining identification with a peer group.

Delayed or accelerated puberty has also been found to have a negative impact on adolescent development in both healthy adolescents and those with chronic medical conditions (Holmbeck, 2002). Delayed sexual maturation is a common symptom of IBD and therefore, based on Holmbeck and Shapera's model, it is possible that adolescents with IBD who experience delayed puberty will struggle in their attainment of developmental outcomes and thus experience significant emotional and behavioural difficulties (Holmbeck, 2002).

Research in the area of adolescent chronic ill health has indicated conflict between the adolescent desire for autonomy and parental concern over disease management. As the adolescent matures cognitively, there is a recognition that he or she should be taking on more responsibility for the management of their condition. Successful management of this involves a decrease in parental involvement in parallel with increased individual responsibility. Conflict often arises when parents continue to control the adolescent's disease management. This parental overprotection can lead to reduced autonomy which has been linked to behavioural difficulties (Holmbeck, 2002).

Summary

Adolescence is recognised as being a critical period in the development of both positive and negative health behaviours. Difficulty negotiating this complex transitional life stage has been linked to the development of emotional and behavioural difficulties. Adolescents with chronic health conditions are at increased risk of such difficulties due to the impact of their condition on normative development and the attainment of outcomes such as autonomy and peer acceptance. Researchers agree that successful transition through adolescence is of particular importance for children with chronic medical conditions due to the impact on health behaviours. As such, investigations into factors which influence positive outcomes for chronically ill adolescents are considered particularly valuable.

1.3 Health Related Quality of Life

Historically, disease severity was the most frequent measure of the extent to which a medical condition affected normative functioning. However in the 1940's, the World Health Organisation (WHO) extended the definition of health to include psychological and social domains, in addition to physical health alone. Since this time, the concept of health has been recognised as extending beyond the parameters of the disease itself (Ravens-Siebrerer *et al.*, 2006; WHO, 1947).

The concept of 'quality of life' is rooted in this definition of health and, in the spectrum of chronic illness, extends to include the impact of all aspects of an illness or disease on an individual's functioning. Quality of life for those with chronic medical conditions is therefore often referred to as 'health related quality of life' (HRQOL) (Levi & Drotar, 1998). HRQOL has latterly been described as a multidimensional concept that encapsulates an individual's subjective experience of living with a chronic medical condition across three broad areas: physically, i.e. the impact on physical functioning; socially, i.e. how the illness impacts upon relationships with others and psychologically, i.e. the impact on psychological well being. HRQOL is thus recognised as a more detailed and useful expression of the consequences of living with a chronic medical condition than simply disease severity (Aaronson, 1989; De Boer *et al.*, 2005; Drossman, 1994a; Glise & Wiklund, 2002; Larsson *et al.*, 2008; Levi & Drotar, 1998; Loonen *et al.*, 2001; Sainsbury & Heatley, 2005).

Given the advances in medical research, individuals with life limiting or life threatening conditions are living longer and measurement of HRQOL has been recognised as an important tool for several different reasons. HRQOL is useful as an outcome measure of an individual's experiences of health care services, including communication, decision making and as an assessment of new treatments or interventions (Higginson & Carr, 2001). HRQOL assessment is also seen as a useful measurement of an individual's psycho-social functioning throughout the course of a disease. Furthermore HRQOL measurement can be used as part of the evaluation of

healthcare costs, provision and development (Levi & Drotar, 1998; Palermo *et al.*, 2008; Seid *et al.*, 2004).

1.3.1 Assessing HRQOL

HRQOL assessments typically fall into two categories - generic and disease specific (Levi & Drotar, 1998). Generic HRQOL assessments examine the relationship between a medical condition and the individual's HRQOL and include assessment of general domains of functioning that are broadly applicable across different medical conditions and different patient populations (Levi & Drotar, 1998; Loonen *et al.*, 2001; Palermo *et al.*, 2008; Ravens-Sieberer *et al.*, 2006). Generic measures are seen as useful for making comparisons with healthy control groups, for comparisons across different conditions and in assessing an individual with co-morbid conditions (Glise & Wiklund, 2002; Loonen *et al.,* 2001; Palermo *et al.*, 2008; Quittner *et al.*, 2003). As the name suggests, however, these measurements tend to be more general and thus less sensitive to individual differences and discrete changes which may occur over time (Quittner *et al.*, 2003).

Disease specific assessments are designed for use with a particular disease or condition and questions are therefore highly sensitive to subtle differences relevant to the condition being measured (Levi & Drotar, 1998; Palermo *et al.*, 2008; Quittner *et al.*, 2003; Ravens-Sieberer *et al.*, 2006). As such, the Food and Drug Administration (FDA) in the USA has recognised the importance of disease specific HRQOL assessments in the evaluation of medical interventions for specific conditions and has recommended that such disease specific HRQOL measures be used routinely as one form of outcome measure for new medical interventions (Gross & Quittner, 2007). One of the main disadvantages of disease specific measures is that they allow only for comparisons within the condition it was designed for and not between different conditions (Glise & Wiklund, 2002; Loonen *et al.,* 2001).

1.3.2 HRQOL in childhood and adolescence

HRQOL research was initially conducted within the adult population (Levi & Drotar, 1998). Over the last 10-15 years, however, there has been increased recognition that HRQOL in childhood and adolescence in the context of chronic medical conditions

is an important construct in its own right (Levi & Drotar, 1998; Quittner *et al.*, 2003; Ravens-Siebrer *et al.*, 2006).

Early attempts to measure child and adolescent HRQOL relied heavily on adaptations of adult measures and failed to recognise the unique, developmental and cognitive considerations within childhood and adolescence (Levi & Drotar, 1998). In adult HRQOL literature, the domains of psychological, social and physical functioning are central to the construct of HRQOL. It was recognised by the WHO (1994) that in childhood and adolescence the additional domains of peer and familial relationships, physical appearance, and academic functioning should be included in HRQOL assessment (WHO, 1994).

How to measure HRQOL in children and adolescents accurately presents a key challenge to researchers and clinicians. A recent review on assessing HRQOL in children highlighted some of these challenges including; the importance of identifying the key dimensions of HRQOL that are relevant across the different developmental stages of childhood and adolescence; using instruments which successfully measure these dimensions; ensuring these instruments are valid across different cultures; the proxy versus self report debate; when to use generic or disease specific measures and the overall long term validity of HRQOL measures (Ravens-Sieberer *et al.*, 2006).

HRQOL is a subjective concept and, as such, self report is the preferred method of measurement. However, the variation of cognitive abilities across the developmental stages of childhood and adolescence necessitates a consideration of the cognitive ability of the child being questioned. Children firstly have to be able to understand the question and, secondly, have a level of self awareness to respond accurately to the types of questions being asked (Quittner *et al.*, 2003). Often, very young children will have a more concrete understanding of the effect an illness has on their lives and, as they grow older, their comprehension of this may change (Quittner, *et al.*, 2003).

Parental proxy measures of HRQOL are also recognised as useful for a number of reasons. Parents are often the main driving force behind accessing medical opinion for their child and as such their opinion is recognised as important. Parent proxy reports are often sought to provide supplementary information and to provide another opinion for clinicians completing assessments of a child's functioning. Parent proxy reports are also often used as an alternative to self report when assessing the HRQOL of children who are unable either cognitively, verbally or physically to complete measures themselves (Quittner *et al.,* 2003; Verrips *et al.,* 2000). There is continued debate, however, as to the reliability of parental proxy report. This is discussed in further detail later in this chapter.

Summary

Health Related Quality of Life is recognised as an important construct in the measurement of the impact of chronic medical conditions on an individual's physical, social and emotional functioning. HRQOL is also seen as having more prognostic significance than disease severity in terms of long term outcomes for individuals with medical conditions. HRQOL measures are either disease specific or generic. Generic assessments are general assessments of HRQOL and allow for comparisons between different medical conditions. Disadvantages of generic measures include a lack of sensitivity to discrete differences between conditions and individual differences. Disease specific measures are recognised as useful in terms of evaluating new interventions for specific conditions. In childhood and adolescence it has been accepted that HRQOL measures should include additional domains of peer relationships, family relationships and academic functioning. Although self report is the preferred method of measurement, parent proxy report is recognised as important both as supplementary information and as an alternative to self report.

1.3.3 HRQOL in adults with IBD

There are few studies that focus specifically on health related quality of life in adolescent IBD. As such, this review of the literature will include findings from

adult and paediatric studies including those which specifically examine adolescent populations.

HRQOL in adults with IBD has been found consistently to be poorer when compared with healthy controls and researchers have been interested in identifying factors associated with HRQOL outcomes for adults with IBD. In addition, current research is focused on identifying the predictive influence of these factors in terms of HRQOL outcomes. To date, disease severity, disease type, gender, personality, psychological well being, self image and socio demographics have all been found to be associated with HRQOL outcomes (Bernklev *et al.*, 2005; Casellas *et al.,* 2002; Cohen, 2002; Glise & Wiklund, 2002; Larsson *et al.,* 2008; Moreno-Jiménez *et al.*, 2007; Pizzi *et al.*, 2006; Sainsbury & Heatley, 2005). Much of the research to date has been conducted in North America and Europe and there is currently a lack of studies investigating HRQOL in a UK IBD population.

Disease severity or exacerbation of symptoms has been recognised as accounting for a significant amount of variance in HRQOL outcomes in IBD (Casellas *et al.,* 2002; Drossman *et al.*, 1989; Larsson *et al.*, 2008; Pizzi *et al.*, 2006). A study by Drossman and colleagues (1989) suggested that patients with IBD who relapse had significantly poorer HRQOL than patients in remission (Drossman *et al.*, 1989). These results were recently replicated in a Swedish study which investigated the relationship between exacerbation of symptoms and quality of life in 742 adults with IBD (Larsson *et al.*, 2008). Participants were assigned to two groups, an exacerbation group (N=166) and a remission group (N=554). Participants completed a brief measure of IBD related health and well being; a measure of HRQOL; a measure of depression/anxiety and a measure of coping. All questionnaires had been translated and validated for use with a Swedish population. Multiple regression analysis was used to establish the extent to which variance in scores on each of the measures was attributable to variables such as gender, diagnosis, disease exacerbation, steroid use, and disease duration.

Results indicated significant differences between the exacerbation group and the remission group in terms of gender (i.e. significantly more women in the exacerbation group) and steroid use (significant increase in steroid use in the exacerbation group). Patients with ulcerative colitis (UC) reported significantly better HRQOL in six out of eight subsets on the measure of HRQOL. High levels of depression and anxiety were reported in both UC and Crohn's disease (CD) patients in the exacerbation group but with CD patients significantly more likely to report depression and anxiety than patients with UC. Regression analysis indicated exacerbation of symptoms and emotional distress (i.e. anxiety and depression) as the most significant predictors of outcomes on HRQOL assessment (Larsson *et al.*, 2008).

The previous study suggested that disease type may account for some of the variance in findings regarding HRQOL in IBD. An earlier study by Cohen (2002) found that patients with CD consistently reported poorer HRQOL in comparison with those with UC. This was interpreted as being due to the more complex nature of CD such as increased risk of inflammation and lack of a curative intervention (Cohen, 2002). More recent studies have challenged these findings, suggesting that no significant differences exist between UC and CD patients even when active and inactive disease is controlled for (e.g. Pace *et al.,* 2003).

A further study focused on assessing which factors predict HRQOL outcomes was carried out with a Spanish population (Casellas *et al.*, 2002). A total of 354 patients with either UC or CD were identified at a single site over a period of almost four years. Information was collected on disease activity, HRQOL and socio-demographics. Disease activity was measured using clinical activity measures for CD and UC, the Harvey-Bradshaw Index (Harvey & Bradshaw, 1980) and the Rachmilewitx Index (Rachmilewitz, 1989) respectively. These indices measure clinical symptoms such as abdominal pain, pyrexia, any complications of the disease and general well being. Symptoms are then given a rating score which is indicative of disease activity based on cut offs for each index (Casellas *et al.*, 2002). No significant differences were found in HRQOL outcomes between patients with UC

and CD. These findings are in contrast to the previously discussed findings (Cohen, 2002; Larsson *et al*, 2008). Disease activity was found to be the most significant predictor of HRQOL. Gender was also found to be significant with males reporting better HRQOL scores than females. The authors also found that higher educational attainment was predictive of better HRQOL (Casellas *et al.*, 2002).

The study was conducted at one site at one time point a factor that increases the reliability of the findings. The study employed a single physician to assess disease activity which negated the need for inter-rater reliability testing, however, no information was given on the validity and reliability of these assessments. Furthermore, clear information on reliability and validity of the measures used was not provided and there was an imbalance in terms of the numbers of inpatients and outpatients being assessed which may also have skewed results. In addition, the researchers did not report effect sizes and also did not provide information on means and standard deviations, thus limiting the extent to which effect sizes could have been calculated.

A similar study was conducted in the USA by Pizzi and colleagues (2006). Three hundred and fourteen patients with IBD completed assessments of HRQOL, disease severity and general health. As in the previous study, no significant differences were found between patients with UC and CD in terms of disease severity or demographical information. HRQOL outcomes were found to be below the norms for the general population. Multiple regression analysis was undertaken to establish the relationship between disease severity, demographics and co-morbid conditions. Disease severity was found to account for the most significant variance in outcomes. The authors also noted that patients in this sample had higher depression and anxiety scores compared to norms based on other disease populations such as rheumatoid arthritis, asthma, migraine and diabetes (Pizzi *et al.*, 2006). There was no psychometric information provided on validity and reliability of measures used.

One of the few studies which examined predictive factors associated with HRQOL outcomes in the UK was carried out by Guthrie and colleagues (2002). The focus of

the study was examining whether disease severity and psychological dysfunction contributed to the variance in HRQOL outcomes in adults with IBD. The authors also examined differences between disease type (i.e. Crohn's disease or ulcerative colitis) and psychological dysfunction. One hundred and sixteen participants completed a measure of disease-related factors which included, disease activity using a modified measure of a Crohn's disease activity index (Sandler *et al.*, 1988), disease severity, service use over a six-month period and disease duration. This was based on an assessment developed by Drossman and colleagues (1991). In addition, participants completed a measure of psychological functioning, the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983), and a generic measure of health-related quality of life, the Medical Outcome Study, Short-Form 36 (SF-36) (Ware & Sherbourne, 1992). Following multiple regression analysis, psychological dysfunction and increased disease severity were predictive of low HRQOL scores on the SF-36 domains of mental health, physical functioning, pain and health perception (Guthrie *et al.*, 2002). Furthermore, psychological functioning was also found to be significantly associated with disease severity. No differences were found between the UC and the CD groups in terms of psychological dysfunction. The authors note that psychological functioning is an important predictive factor in relation to HRQOL outcomes in adults with IBD and that psychological treatment is likely to improve HRQOL. The study had several limitations. Reliability and validity was reported as acceptable for the HADS and the SF-36, however, no psychometric information was provided for the disease-related measure. It was also noted that the disease activity measure was originally designed for use with a Crohn's disease population however it was administered in this instance for both Crohn's disease and ulcerative colitis patients. The authors noted that they chose to administer a generic HRQOL measure as opposed to a disease specific measure which may have not picked up on particular areas of HRQOL specific to an IBD population. However, the authors employed a large sample size, which increased the statistical power of the findings.

A general practice (GP) survey of the HRQOL of adults with IBD was conducted by Rubin and colleagues (2004). Four hundred and nine adults from 23 GP practices in

the North East of England participated in the research, which involved the completion of a measure of HRQOL, the UK Inflammatory Bowel Disease Questionnaire (IBDQ) (Cheung *et al.*, 2000). The authors examined whether age, gender, social deprivation (based on post code related census information), disease type and health care access (attendance at gastroenterologist outpatient clinics within the preceding 12-month period) had an association with HRQOL scores. Significantly poorer HRQOL outcomes were associated with females, those with Crohn's Disease, younger people and those attending outpatient clinics. Social deprivation was also associated with poorer HRQOL. The findings were limited, however, for a number of reasons. Social deprivation was determined in a particularly crude manner, using general statistics taken from the 1991 census, yet the study was conducted more than 10 years since the completion of the census which may have compromised the validity of this information. The authors acknowledged that the use of population based information does not allow for individual circumstances to be considered. In addition, the authors did not report on the validity and reliability of the IBDQ measure used although they did comment on the fact that the measure had been validated for use with a British population. The advantages of this research design are that it reduces the extent to which selection or sampling biases may skew results through clinic based studies.

Individual differences have also been attributed to the variance in findings across studies of HRQOL in those with IBD. A recent study by Moreno-Jiménez and colleagues (2007) investigated the relationship between personality factors and HRQOL in adults with IBD. The results indicated that personality factors such as neuroticism, low self esteem and difficulty describing feelings were all linked to poorer HRQOL (Moreno-Jimenez *et al.*, 2007).

It has also been suggested that body or self image in the context of personal relationships may have a significant impact on the HRQOL of those with IBD (Drossman *et al.*, 1991; Irvine, 1996). The symptoms of IBD, such as increased frequency and urgency of defecation, the side effects of treatment such as weight gain, acne and post surgical use of a stoma bag can impact negatively on self image

and sexuality (Damgaard *et al.*, 1995; Giese & Terrell, 1996; Moody *et al.*, 1992; Moody & Mayberry, 1993;). Some individuals with IBD have reported avoiding engaging in sexual relationships, due to their negative body image. It could, therefore, be assumed that this would impact upon HRQOL (Moody & Mayberry, 1993).

Summary

A limited number of studies have investigated factors which influence HRQOL outcomes in the adult IBD population. Identified predictive factors of HRQOL outcomes include disease severity and psychological functioning. Other factors such as disease type, gender, personality factors and body image have also been associated with HRQOL outcomes. Use of a stoma bag and negative body image have been suggested as having an adverse affect on sexual functioning and well-being and are likely to negatively influence HRQOL outcomes. Although many of the studies discussed employed large sample sizes, which increased the statistical power of the studies, effect sizes were not commonly reported. Furthermore, the absence of psychometric information such as reliability and validity on measures used across a number of studies reduces the extent to which results can be generalised.

1.3.4 HRQOL in Paediatric IBD

Factors linked with HRQOL outcomes in paediatric IBD have also been examined in a small number of studies. These include disease severity, steroid use, coping strategies and psychological functioning. The following section provides an overview of the paediatric literature into HRQOL in IBD and discusses some of the limitations of the results found.

Rabbett and colleagues (1996) conducted one of the few studies looking at the quality of life of young people with IBD in the UK. Their findings from a 10-week cross sectional study showed that children with IBD struggled to attend school regularly and to participate in sports and peer activities such as sleepovers. Rabbett and colleagues noted that those taking steroid medication were more at risk of having depression when compared with healthy peers. Surgical interventions were seen as

the most effective treatment but that the associated use of a stoma bag resulted in increased anxiety and limitations on physical activities such as physical education (PE). This study was limited by the use of a non-validated assessment measure and by a small sample size (*N*=16). Despite the methodological limitations, this study was one of the first to highlight the broad range of difficulties that children and young people with IBD in the UK may be experiencing.

A follow-up study in the same centre was conducted by Akobeng and colleagues (1999). The authors developed a questionnaire based on focus groups held to identify areas of concern for young people with CD. This questionnaire was then given to a group of young people with CD (*N*=16). The findings indicated that main areas of concern included the unpleasant symptoms of CD (such as rectal bleeding and abdominal pain), body image (e.g. short stature), weight loss and sleep. Those who had undergone surgical interventions reported that whilst this had a good impact on symptoms, having a stoma was a source of distress and placed restrictions on physical activities which in itself was stressful. Other common problems included effects of steroid medication, school absences, reduced participation in sports, difficulties with friendships and difficulty with travelling distances (e.g. for holidays/school excursions)(Akobeng *et al.*, 1999). This was an exploratory, pilot study which limits the extent to which findings can be generalised. In addition, the small sample size, the lack of statistical analysis of findings coupled with the lack of psychometric information on the measure further limit the findings.

A study conducted by Loonen and colleagues in the Netherlands (2002) investigated the HRQOL of children and adolescents with IBD aged 8-18 years (N=83). Different domains of HRQOL were assessed using both a generic measure (the TNO-AZL Children's Quality of Life Questionnaire (TACQOL) - Vogels *et al.*, 2000) and a disease specific measure (the Impact-II NL - Loonen *et al.*, 2002). Reliability was reported using Cronbach's alpha α = 0.66-0.79 (TACQOL) and α = 0.57-0.86 (Impact-II). Cronbach's alpha is considered the most appropriate measure of internal consistency with an alpha co-efficient between 0.5-0.7 considered acceptable for small and large scales respectively (Pallant, 2001). This would

suggest that both measures used in this study had acceptable levels of reliability. Disease severity was also assessed, using self report 'symptom cards'. All responses were compared with a large sample of healthy peers (N= 1810) (Loonen *et al.*, 2002). The authors reported that HRQOL of children and adolescents with IBD was significantly lower than the reference population. Disease severity was inversely correlated with HRQOL on both measures. On the generic measure, the authors found that younger children (<12 years) reported equivalent HRQOL scores on the 'cognitive functioning' domain when compared with healthy controls and reported significantly better HRQOL on this domain in comparison with adolescent IBD counterparts. It was noted that the younger group reported fewer symptoms than the adolescent group which may have influenced the differences found. The authors reported that when compared with the reference population, adolescents with IBD had significantly poorer HRQOL across four domains, 'body complaints', 'motor functioning', 'autonomy' and 'negative emotions' (including sadness and anxiety). Loonen and colleagues postulated that lower HRQOL in adolescents compared to younger children may have been related to the developmental context of adolescence, when issues such as striving for autonomy and acceptance by peers may have been adversely affected by having a diagnosis of IBD. Although the authors used well validated and reliable measures, they note that the findings from this study were limited due to the small sample size. This was particularly relevant when the group was divided into older and younger age groups with the latter having a sample size of N=18. This reduces the extent to which findings can be seen as representative of the adolescent population.

De Boer and colleagues (2005) conducted a further investigation into HRQOL and psychosocial functioning in Dutch adolescents aged 12-18 years with IBD. A total of 40 adolescents and 38 parents were involved in the study and were asked to complete self report questionnaires of self esteem, anxiety, health related quality of life and behaviour. Measures used included the Dutch Children's AZL/TNO Quality of Life questionnaire (DUCATQOL) (Kolsteren *et al.*, 2001), the Dutch version of the Harter Self Perception Profile (Treffers *et al.*, 2002), the Dutch version of the State-Trait Anxiety Inventory (Bakker *et al.*, 1989) and the Child Behavior Check

List (Achenbach, 1983). Results suggested that HRQOL was consistently poorer in children and adolescents with a diagnosis of IBD when compared with the normal population, particularly on domains of social and emotional functioning. Additionally, boys reported significantly worse HRQOL than their female counterparts. This finding is in contrast with a previous adult study which suggested that females with IBD report significantly worse HRQOL than males (Casellas *et al.*, 2002). Regression analyses indicated that self esteem was the most significant predictive factor in terms of HRQOL outcomes (De Boer *et al.*, 2005).

The authors note that the DUCATQOL was, at the time of this study, not empirically validated within the population being studied. De Boer and colleagues did suggest, however, that the measure showed internal consistency and was reproducible, based on a study by Kolsteren and colleagues (2001). No measures of validity or reliability were indicated for this measure. Similarly, the authors chose to implement Dutch translations of the Harter Self Perception Profile and the State-Trait Anxiety Inventory yet used a non Dutch measure of the CBC which again questions the reliability and validity of the results found. In addition, the STAIC is validated for children and adolescents aged up to 15 years and as this study included older adolescents the authors acknowledged that they were unable to utilise data recorded from older participants. The authors calculated effect sizes for the comparison of means across the domains of HRQOL being assessed. These effect sizes ranged from 0.21 to 1.05, with moderate to large effect sizes found for total HRQOL scores, family functioning, boys' physical functioning and emotional functioning (De Boer *et al.*, 2005). Small effect sizes were found for girls' physical functioning and social functioning for both boys and girls. A further limitation was the absence of information on disease severity and use of medication which have been recognised as important factors to consider when measuring long term outcomes in the IBD population (Mackner & Crandall, 2005).

A study by Otely *et al.*, (2006) investigated the HRQOL of 218 paediatric patients (age range 9-17 years) over the first year of a diagnosis of IBD at 18 sites across North America. The researchers also investigated the extent to which factors such as

hospitalisation, disease type, treatment and complications affected HRQOL. Information was taken from a database of all paediatric IBD patients in North America (Otley *et al.*, 2006). This database included demographic information on each child plus their scores on the IMPACT questionnaire (Otley *et al.*, 2002). The IMPACT questionnaire is a disease specific measure of HRQOL in paediatric IBD with high validity and reliability (Otley *et al.*, 2002). The IMPACT yields scores across six domains: bowel, systemic, emotional, social/functional, body image and tests/treatment. The totals of each domain were summed to give an overall HRQOL score (range 0-245). The database also included baseline assessments of disease severity based on physician global assessment of disease severity which included, number of hospitalisations, interventions (both medical and nutritional), surgeries and 'extraintestinal manifestations of IBD', co-morbid immunodeficiency complications outside of the colon area, such as mouth ulcers (Otley *et al.*, 2006 – p.685) (Otley *et al.*, 2002). Patients' also completed a self-rating of global functioning using Cantril's Self Striving Scale – a ten point assessment of quality of life (Cantril, 1965). The IMPACT questionnaire was completed by each participant at the initial diagnostic appointment, 30 days after diagnosis and every four months following, for a period of a year and information was then stored in the database (Otley *et al.*, 2006).

The authors conducted analyses to assess which, if any, of the recorded baseline factors predicted HRQOL at 12 month follow up, including; age, sex, diagnosis, disease severity, patient assessment of global functioning, number of symptoms at time of diagnosis, number of interventions and number of interventions which included use of steroid drug therapy. In addition, the researchers compared mean IMPACT scores across the 12 month period.

The results indicated that the mean total HRQOL scores on the IMPACT significantly improved over the year post diagnosis. This would suggest that there may be some period of adjustment that can affect overall HRQOL in the first year post diagnosis. No significant differences on total HRQOL were found between patients who had been taking steroid medication and those who had not. Similarly,

no significant differences were found in the overall HRQOL of those who had been hospitalised or sought medical treatment with those who had not, during the assessment period. The results also suggested that age, disease severity and time from diagnosis each had a significant effect on HRQOL scores. As age and disease severity increased, HRQOL decreased and as time since diagnosis increased, HRQOL increased. Regression analysis indicated that age was the only significant predictive factor in terms of HRQOL outcomes (Otley *et al.*, 2006).

One of the main variables being assessed in this study was disease severity, based on clinicians' subjective ratings. There was no indication as to the validity or reliability of this approach, including no information on inter-rater reliability despite the fact that this study was conducted across multiple sites and involved a large number of clinicians. The authors also noted that the completion of the IMPACT questionnaires and the assessments of disease severity were not always done in tandem, thus reducing the extent to which one can draw inferences about the impact of disease severity on HRQOL.

A single site study into HRQOL in children and adolescents was conducted by Cunningham and colleagues (2007). The main objectives of this study were to compare HRQOL in a paediatric IBD sample with healthy controls and to investigate the relationship between increased symptoms and effects of steroid medication on HRQOL. The authors conducted their research at a single site within a gastroenterology outpatient clinic in Ohio, USA. A total of 49 participants and their carers agreed to participate in the research. The healthy comparison group of 49 individuals was matched in terms of age and ethnicity. Participants were assessed using the Child Health Questionnaire (CHQ) (Landgraf & Abetz, 1997), a widely used generic measure of HRQOL (Cunningham *et al.*, 2007). IBD and steroid side effects were assessed using a 20-item checklist of common IBD symptoms and side effects. These items were divided into five domains: pain related symptoms; stooling related symptoms; general medical symptoms; wellbeing and steroid side effects. Items were ranked using a Likert scale for the frequency that each participant

experienced each symptom. HRQOL was measured via self report and via parental proxy report using the parent version of the CHQ.

Results on parental report indicated that children with IBD had significantly poorer overall physical and psychological health than healthy children. This accounted for significant differences across nine out of twelve subscales on the CHQ. Interestingly, on self report of IBD and healthy children, a significant difference between the two groups was found on only the general health subscale. Parental report suggested significantly worse HRQOL attributable to increased symptoms, however, on self report, despite a trend towards the same finding the results were not statistically significant. Individual examination of steroid side effects and the relationship with HRQOL also yielded non significant differences (Cunningham *et al.*, 2007).

The authors utilised the Child Health Questionnaire (CHQ) (Landgraf & Abetz, 1997) which is reported to discriminate accurately between physically healthy children and those with physical health conditions. The CHQ has been assessed for construct validity via factor analysis and comparison with similar child and adolescent health assessments. The validity of the CHQ against other generic measures of HRQOL was, however, not reported. It would have been useful, therefore, to have had some information on this measure's validity and reliability for measuring HRQOL as well as an indication of the age range the measure is validated for, given that the population assessed ranged from 10-18 years of age. The authors noted that there are difficulties in grouping together children and adolescents and, given that the majority of the participants were in the adolescent age range, admitted that the results found may not be easily generalised to a younger population. This highlights the importance of assessing adolescent populations alone rather than grouping together with younger patients with the same condition. The authors further suggested that the sample size was relatively small thus limiting the extent to which conclusions could be generalised. As such, it would have been useful for the authors to have included the effect sizes for the results found.

The previous studies were carried out with Dutch and North American populations and, to date, there have been few studies which have examined the HRQOL within a UK IBD paediatric population. A study by Richardson and colleagues (2001), conducted one of the only cross-cultural comparisons of HRQOL in British and Canadian paediatric IBD patients. The authors investigated whether British and Canadian children differed in terms of their ratings of illness related concerns. This study found that the two groups correlated highly in terms of the frequency and importance of health related concerns. These findings suggest that English and Canadian children with IBD have similar health related concerns and as such, questionnaires developed for the North American population are likely to be relevant for use with a British population.

In addition to comparative studies with healthy peers, there has been interest in examining what factors account for better HRQOL in the adolescent population. One such study was conducted by MacPhee and colleagues (1998) who indicated that higher HRQOL within the IBD population was related to the presence of social support. Adolescents with IBD are also more likely to rely on family members than friends/peers to cope with the demands of living with IBD and thus parents' own coping styles were found to be positively correlated with better HRQOL. This would suggest that information on parental well being may be an important factor to consider in terms of the HRQOL of adolescents with IBD (MacPhee *et al.*, 1998). Further research in this area has suggested that adolescents with IBD are more likely to adopt avoidant coping mechanisms than healthy peers and those who use more adaptive coping mechanisms are more likely to report better HRQOL (Van der Zaag-Loonen *et al.*, 2004).

Of the above studies only three (Akobeng *et al.*, 1999; Rabbet *et al.*, 1996 & Richardson *et al.*, 2001) were conducted in the UK. A recent systematic review of quality of life research in IBD (Maity & Thomas, 2007) revealed only three studies that were conducted within the UK. These included the studies by Rabbet and colleagues (1996), Akobeng and colleagues (1999) and a study which evaluated the influence of nutritional interventions on the HRQOL of children with IBD (Afzal *et*

al., 2004). This highlights the current dearth of research the HRQOL of those with IBD in the UK and in particular, within a Scottish population given that, as mentioned above, Scotland has the highest incidence of IBD across the British Isles (Sawczenko *et al.*, 2001),

Summary

There has been increased interest in the HRQOL of young people with IBD. Young people with IBD consistently report poorer HRQOL when compared with healthy peers. There are a range of factors which have been identified which appear to influence HRQOL outcomes. These include:

- disease severity
- steroid use
- coping style
- parental factors
- psychological functioning
- body image
- gender
- age

There are limitations as to the generalisability of findings due to methodological shortcomings such as small sample sizes, a lack of reported effect sizes, use of non validated measures, use of multiple sites and a lack of consideration of developmental differences within samples. The majority of studies have been conducted in North America and other parts of Europe and there is currently a dearth of research into the HRQOL of adolescents with IBD in a UK population.

1.3.5 Gender differences in HRQOL

As noted above, gender differences have been highlighted in HRQOL outcomes in the IBD population. However, as discussed, differences exist in terms of whether males or females report better HRQOL as adult studies have suggested better outcomes for males (Casellas *et al.*, 2002; Rubin *et al.*, 2004) whilst in the paediatric literature the opposite has been suggested (De Boer *et al.*, 2005). Given the lack of studies in the IBD literature which highlight gender differences, an exploration of

studies in other chronic illness populations which have examined HRQOL is considered appropriate.

Within the paediatric HRQOL literature, gender differences have been frequently reported with females typically reporting lower HRQOL than males across different illness groups such as cystic fibrosis (Arrington-Sanders, *et al.*, 2006; Gee *et al.*, 2003) diabetes (Naughton *et al.*, 2008) epilepsy (Benavente-Aguilar *et al.*, 2004; Devinsky *et al.*, 1990; Raty *et al.*, 2003). Studies which cumulatively examined the HRQOL of children and adolescents with different medical conditions have also indicated gender differences with females reporting worse HRQOL than males. These studies include one study which examined asthma, arthritis and diabetes (Petersen *et al.*, 2006) and one which examined asthma and epilepsy (Austin *et al.*, 1996).

In terms of specific domains of functioning within HRQOL measures, physical and emotional functioning appear to be the areas where significant gender differences exist. Within the identified studies, statistically significant differences were reported between females and males on domains of physical functioning (Arrington-Sanders *et al.*, 2006; Naughton *et al.*, 2008; Petersen *et al.*, 2006) and mental health/emotional functioning (Arrington-Sanders *et al.*, 2006; Gee *et al.*, 2003; Naughton *et al.*, 2008; Petersen *et al.*, 2006), with females reporting poorer functioning than males across these domains.

Gender has been recognised as an important variable in moderating both physical and mental health outcomes in adolescence (Williams *et al.*, 2002). There are several explanations as to why gender differences exist in terms of developmental outcomes in adolescence. It has been suggested that females who reach puberty earlier or later than their peers are at increased risk of emotional and behavioural difficulties due to the need for identification with and acceptance from a peer group (Holmbeck & Hill, 1991; Laitinen-Krispijn *et al.*, 1999). It is possible that females with IBD may be at an increased risk of developing emotional and behavioural difficulties due to the impact that IBD has on pubertal onset, as discussed earlier in

this chapter. Body-image and body dissatisfaction have also been put forward as reasons why adolescent females are more at risk of developing depression than their male counterparts (Seeley *et al.,* 2009). The symptoms of IBD and steroid treatment can result in weight fluctuations, acne and cushingoid features, all of which are likely to have an impact on body image and body satisfaction. It could therefore be suggested that females with IBD may be at increased risk of emotional and behavioural difficulties due to the increased risk of negative body image associated with IBD and its treatment. There have been a number of studies within the adult population which have suggested a link between body image and depression in female IBD patients (e.g. De Rooy *et al.,* 2001; Okoro & Kane, 2009; Reddy & Wolf, 2001) however this has not, to date, been examined within an IBD adolescent population. There is also some evidence to suggest that females with chronic illnesses such as asthma have an increased propensity to self –focus (Van Pelt *et al.,* 2006; Wright, 2005). This increased self-focus is linked to the increased need for self-monitoring in illness populations in terms of treatment and symptoms and has, in turn, been linked to increased psychological distress (Van Pelt *et al.,* 2006). Given the negative symptoms and side-effects of IBD and its treatment, it could be postulated that female adolescents with IBD may also be more inclined towards increased self-focus due to the potential embarrassment associated with symptoms and this increased self-focus may then result in psychological dysfunction, though this has not, to date been examined.

It has also been postulated that one of the reasons for gender differences in psychosocial functioning may be linked to the female tendency toward self-objectivity i.e. perceiving the self as an object for others to look at and evaluate (Grabe *et al* ., 2007). This is linked to the thin body and physical beauty ideal of western societies which places higher value on those individuals who are more physically attractive (Jackson *et al.*, 1995). Self-objectivity is believed to result in increased preoccupation with physical appearance and has been suggested as a mediating factor in the development of depression in adolescent girls (Grabe *et al.*, 2007). Actual or perceived deviation from what is considered 'normal', in terms of behaviour or physical appearance, is recognised as a risk factors for emotional and

behavioural difficulties in adolescence, due to the impact or perceived impact on peer acceptance (Holmbeck, 2002). Therefore it is plausible that females with chronic illnesses are more likely to be conscious of physical differences to peers than their male counterparts and that this may have a role in reducing HRQOL.

As noted, gender differences in the paediatric IBD population have not been widely examined. It is conceivable that females with IBD are likely to experience similar concerns as females in other illness populations which have been put forward as possible reasons for gender differences in HRQOL outcomes. IBD symptoms and treatment can have a significant impact on physical appearance, pubertal development and growth. These factors, coupled with the increased awareness of physical appearance and peer perception for females particularly, would suggest that females with IBD may experience poorer HRQOL than their male counterparts. As such, further research in this area is warranted.

Summary

Gender differences in self-reported HRQOL in children and adolescents are common with females typically reporting lower HRQOL scores than males. This is particularly pertinent for physical and emotional domains on HRQOL measures. Possible reasons for these differences include pubertal changes, reduced body image, body dissatisfaction, increased self-focus and increased self-objectivity. Gender differences within the paediatric IBD population have not been well researched. As such further investigation of gender differences in adolescents with IBD would be considered valuable.

1.3.6 Parent proxy versus self report in assessing HRQOL

In 1993 the WHO published guidelines on measuring quality of life of children and young people recommending that self report be used over parent proxy reporting (WHO, 1993). Since then, measurements of HRQOL in childhood and adolescence are most often completed by the patient themselves. It has, however, been recognised that parents provide valuable information on their children and as such, parental proxy report is often seen as an appropriate alternative, or addition, to self

report (Quittner *et al.*, 2003). Parents are often the driving force behind accessing treatment for their children in the health, mental health and learning disability populations, however a large volume of research indicates that in comparisons of self versus parental proxy report, agreement is moderate to poor (Achenbach *et al,* 1987; Brunner *et al.*, 2004; Garber *et al.*, 1998; Loonen *et al.,* 2002; Varni *et al.*, 1998; Waters, *et al.*, 2003; White-Koning *et al.,* 2006). This difference between self and proxy report has latterly been referred to as 'cross-informant variance' (Varni *et al.*, 1995).

It has been suggested that parents are often better identifiers of observable aspects of their children's functioning (such as behaviour) but much poorer at identifying internal functioning such as emotional/psychological difficulties, (e.g. low mood, self esteem) (Achenbach *et al,* 1987; Garber *et al.,* 1998; Modi & Quittner, 2003; Verrips *et al.*, 2000; Verrips *et al.*, 2001; Waters *et al.*, 2003) level of pain experienced (Brunner *et al.*, 2004; Burrows & Berde, 1993; Waters *et al.*, 2003) and social functioning (Brunner *et al.*, 2004; Verrips *et al.*, 2001).

Furthermore, there is a lack of clarity as to whether differences between parents and child report are a consequence of parents overestimating or underestimating their child's difficulties, or a combination of both (Quitter *et al.*, 2003). It has been shown that parents tend to overestimate their child's HRQOL in physical functioning (Brunner *et al.*, 2004; Modi & Quittner, 2002; Theunissen *et al.,* 1998) and underestimate HRQOL in emotional functioning. A recent study by White-Koning and colleagues (2006) examined HRQOL in children with cerebral palsy across ten domains of functioning. The authors found that parents reported significantly lower HRQOL scores for their children in eight out of ten domains of functioning, with only one domain (finances) where parents rated HRQOL as higher than their children's ratings (White-Koning, 2006). In a similar study of healthy and ill adolescents, parents of adolescents with a chronic condition reported higher HRQOL scores on pain and social/emotional health and lower scores on physical health domains, than their children (Waters *et al.*, 2003). Across the literature base, there are various conflicting findings as to the degree and direction of cross informant

variance between parents and young people. In particular, the direction of agreement is poorly understood (White-Koning *et al.*, 2006).

A recent, mixed methodology study, looking at self/proxy reporting, suggested that children and adolescents have a propensity for extreme scoring i.e. scoring either very high or very low on Likert response scales (Pigeon-Reesor, 2008). This may explain some of the variance found between parent and self reports however, the author noted that the small sample size (N=15) limits the extent to which the findings can be generalised. As discussed, research has suggested that parental ratings of their children's physical functioning tend to be more consistent with children's ratings of their physical functioning. In contrast, parental ratings of their children's emotional or social functioning tend to be either over or underestimates of what their children rate (Achenbach *et al.*, 1987; Herjanc & Reich, 1982). A systematic review by Eiser and Morse (2001), reviewed the research in proxy/self report on HRQOL measures. Their findings indicated that the wide range of HRQOL measures used across research studies may have an impact on agreement between parent-report and self report. Difficulties include a lack of consistency between whether generic or disease specific measures are used and the poor reliability and validity of measures for both self-report and parental report (Eiser & Morse, 2001).

Eiser and Morse also reviewed studies which examined whether the relationship to the rater (i.e. parent or clinician) resulted in better or worse agreement. They reported that one study (Billson & Walker, 1994) reported no significant difference between parent-child and clinician-child agreement and another study (Phipps *et al.*, 1999) reported better parent-child than clinician-child agreement. More recently, it has been suggested that parents' responses on proxy report are based on their perception of their child's functioning, as opposed to their perception on how their child perceives themselves to be functioning. This would suggest that the two are often not comparable, though are each of importance to clinicians (Waters *et al.*, 2003). It has also been suggested that certain factors can influence the amount of variance found between parent and self report. These include factors such as age, gender of both respondents and disease type (Cantwell *et al.*, 1997; Edelbrock *et* al.,

1986; Seiffge-Krenke & Kollmar, 1998; Theunissen *et al.,* 1998). The directional influence of these factors is also the subject of increased debate, with some studies suggesting that some factors result in *better* agreement whilst others argue that the same factors result in *worse* agreement (White-Koning *et al.*, 2006).

Summary

Parents are recognised as providing important information on their child's functioning. As such, parent proxy report is seen as an additional means of attaining information about their child or an alternative to self report if the child or young person is unable to provide this themselves. Despite the reliance on parent reporting in HRQOL and in areas such as treatment decisions and health provision, there is an evidence to suggest that agreement between self and parent reporting is moderate to poor with parents often either underestimating or overestimating how well their children are functioning. A recent review of this literature concluded that parents' and children's ratings of physical domains on HRQOL measures tend to be more consistent with each other than ratings on emotional/non physical domains. There is currently a lack of clarity regarding which factors influence better agreement.

1.4 Psychological Functioning in IBD

Psycho-social functioning in the context of chronic medical conditions is recognised as an important consideration for researchers and clinicians alike. There is increased recognition of the impact of psychological distress on disease course, experience of illness and health seeking behaviours and the consequences of this on health care provision. The following section gives an overview of the main considerations in relation to psycho-social functioning in the IBD population.

It has been accepted that patients with IBD who experience exacerbation of symptoms are more at risk of developing psychosocial dysfunction and that such difficulties may also affect the course of the disease (Levenstein, 2002; Porcelli *et al.*, 1996). Given that IBD is characterised by exacerbation and remission of symptoms, which have a significant impact on normative functioning, it is perhaps

not surprising that patients may be more likely to experience stress, depression, anxiety and low self esteem (Casati *et al.*, 2000).

There has been some evidence to suggest that increased stress has an effect on disease severity in patients with IBD, with high levels of stress and depressive symptoms associated with exacerbation of illness, increased health seeking behaviour and more frequent relapse (Drossman, 1996; Levenstein *et al.*, 2000; Mittermaier *et al.*, 1998). However, a number of studies have found no relationship between exacerbation of disease symptoms and stress/psycho-social functioning (e.g. Riley *et al.*, 1990). Furthermore, there is a lack of clarity as to the causal direction of factors such as stress and depression i.e. whether depressed individuals are more likely to experience exacerbation of symptoms or whether exacerbation of symptoms is itself a trigger for depression. A longitudinal study of both ulcerative colitis and Crohn's disease patients suggested that depressive patients were more likely to experience exacerbation of symptoms than non-depressive patients with the same condition (Mittermaier *et al.*, 1998).

More recently, attempts have been made to clarify the association between disease activity and psycho-social functioning via prospective, long term assessment of patients with IBD. Levenstein and colleagues (2000) assessed the psycho-social functioning in adults with IBD over a five year period. The authors found that patients with high levels of stress were significantly more likely to experience exacerbation of symptoms than those with lower levels of stress (Levenstein *et al.*, 2000). However, there is some evidence to suggest that some patients with IBD experience more functional symptoms[1] due to anxiety or stress and this is more likely to be experienced as exacerbation of symptoms (Minderhoud *et al.*, 2004). At present there is a lack of longitudinal, prospective studies which have controlled for the difference between functional symptoms and actual exacerbation of IBD symptoms, within the IBD population.

[1] The term functional refers to symptoms which have no identifiable organic pathology and are believed to have a significant psychological underpinning (Crane & Martin, 2004)

Early studies indicated that young people with IBD may be significantly more likely to meet criteria for psychiatric dysfunction (Andrews *et al.*, 1987) and may be at increased risk for developing depression and low self esteem (Raymer *et al.*, 1984; Steinhausen & Kies, 1982) when compared with healthy peers. These studies were limited by methodological difficulties such as small sample sizes and use of non validated measures. Wood and colleagues (1987) investigated the prevalence of psychological dysfunction in young people aged 6-17 years with CD (N=51) and UC (N=37) using empirically validated measures. Young people with IBD were significantly more likely to experience psychological dysfunction than healthy peers. Approximately 39 per cent of patients with CD and 29 per cent of patients with UC were found to attain clinically significant scores on a measure of psychological functioning (Wood, *et al.*, 1987). It has been suggested that young people with IBD and their parents are more likely to present with Axis II disorders and have insecure attachments than healthy comparison groups (Szajnberg *et al.*, 1993). Again, however, this study employed a relatively small sample size (N=15) and relied on a range of relatively new and non validated assessment measures upon which to derive this conclusion. A more recent study by De Boer and colleagues (2005) indicated that, in comparisons with healthy peers, adolescents with IBD did not report significantly different responses on measures of self esteem and anxiety.

In comparison studies of psychological functioning in paediatric IBD and other chronic paediatric medical conditions, no significant difference between IBD patients and those with other chronic medical conditions, have been found. A study by Burke and colleagues (1989) suggested that young people with CD (*N*=41) and UC (*N*=12) had an increased lifetime prevalence of depression (29 per cent and 21 per cent respectively) when compared to those with cystic fibrosis (*N*=52) (11.5 per cent), based on structured interviews. Rates of depression at the time of the study were not significantly different between the three groups. No significant difference between the three groups was found in terms of the prevalence of anxiety disorders, both at the time of the study and in lifetime prevalence (Burke *et al.*, 1989).

A similar study by Engstrom (1992) suggested that whilst patients with IBD have higher rates of depression, anxiety and lower self esteem, compared with healthy peers, this was not significantly different to adolescents suffering from chronic headaches or diabetes (Engstrom, 1992). Although the author matched his groups (age and gender) for comparison, the group sizes remained relatively small (N=20), no information was provided on the psychometric quality of measures used nor on the reliability of the interviewer (Mackner *et al.*, 2004). A meta-analysis of the mental health of those with paediatric chronic medical conditions found that those with IBD had the highest prevalence of psychological dysfunction when compared with other medical conditions (Lavigne & Faier-Routman, 1992). A more recent study by Gold and colleagues (2000) explored the prevalence of depression, behavioural problems and low self esteem in both young people with IBD and those with functional gastrointestinal disorders. The authors found that neither group attained scores within clinically abnormal ranges. The functional gastrointestinal group scored significantly higher on depressive symptoms, behavioural problems and had significantly lower self esteem than the IBD group (Gold, *et al.*, 2000).

Some studies have suggested that whilst psychological functioning may be poor in the initial stages post diagnosis, after one year post diagnosis, psychological functioning in paediatric IBD is not significantly different from the normal population (Mackner & Crandall, 2006; Maity & Thomas, 2007). It is plausible that this may explain some of the variance in the findings reported above, as most studies did not control for length of time since diagnosis.

Mackner and colleagues (2007) investigated psychosocial outcomes in young people who had been diagnosed with IBD for one year or more. The authors assessed 50 adolescents aged 11-17 years who were attending a gastroenterology out-patient clinic in Ohio, USA. Assessment of a comparison group of 42 healthy peers was also completed. The assessment included measures of behaviour problems, social functioning, depression, anxiety, self esteem, coping strategies and social support. Standardised assessments of disease activity were completed by gastroenterologists. No significant differences between the IBD group and the control group on measures

of behaviour, social functioning and self esteem were found. Similarly, no significant differences between the two groups were found in coping strategies or social support. Disease severity was not found to be associated with psycho-social functioning, in contrast with previous studies.

Due to the variance in findings in terms of whether or not adolescents with IBD are at increased risk of developing psychological difficulties, more recent studies have attempted to investigate what factors, if any, may contribute to the onset of psychological difficulties. Given the unpredictable remitting and relapsing nature of IBD, it seems plausible that symptom severity may impact significantly on an individual's well being, particularly during adolescence. Whilst earlier studies did not control for disease and symptom severity, those that have, have found mixed results regarding the association between disease severity and psycho-social functioning. A number of studies have indicated that disease exacerbation or symptom severity are not significantly associated with psycho-social functioning (Mackner & Crandall, 2005; Steinhausen & Kies, 1982; Wood *et* al., 1987) whilst other studies have found the opposite (Burke *et al.*, 1989; 1994).

Furthermore, a study by Ondersma and colleagues (1997) found a relationship between subjective experiences of illness severity and negative affect but, interestingly, this association was not found to be significant in terms of objective (i.e. clinician assessment) measures of disease severity. This would suggest that disease severity (as measured clinically) may not be as important as subjective reports of well-being (Ondersma, *et al.*, 1997).

Summary

Findings are mixed as to whether patients with IBD have poorer psycho-social functioning in comparison with their healthy peers and with those with other chronic medical conditions. The most common psychological difficulties reported are depression, anxiety and low self esteem. Factors which appear to influence outcomes include disease severity, steroid use, stress, maternal depression and family dysfunction. Some studies have indicated a relationship between age at time of

diagnosis and psychological dysfunction. Methodological flaws such as small sample sizes and use of non-validated questionnaires and the remitting nature of IBD itself may account for the variance in findings.

1.5 Parental Psychological Well-being

Mothers of children with chronic medical conditions have been found to be at increased risk of psychological difficulties such as depression, anxiety and stress, compared with mothers of healthy children (Breslau, *et al.,* 1982; Gayton *et al.*, 1977). This may be related to the increased burden of caring for a child with a chronic medical condition including attending multiple medical appointments, managing, often complicated, treatment regimens and coping with the implications of the condition on the child's development trajectory (Quittner *et al.*, 2003). Parental psychological well being has been found to have a significant influence on their child's experience of living with a chronic condition, both in terms of levels of distress and adherence to treatment. Maternal distress has been found to be positively correlated with child distress, although there is little information on the causal direction of this relationship (Burke *et al.*, 1994; Cieurzo, 2003).

It has been suggested that parents of children and adolescents with IBD may be at increased risk of developing psychological difficulties (Burke *et al.*, 1994; Cunningham & Banez, 2006; Engstrom, 1991). Parental distress has also been found to be linked to exacerbation of IBD in young people (Greenley & Cunningham, 2009; Tojek *et al.*, 2002; Wood *et al.,* 1989).

A study by Engstrom (1991) examined levels of parental distress and social support in parents of children with IBD in comparison to parents with healthy children. Findings suggested that mothers of children with IBD had significantly higher levels of parental distress than either fathers or both parents in the healthy control group. Both mothers and fathers reported significantly lower levels of social support than healthy controls. These results were limited, however, by the small sample size (N=20) for each group (Engstrom, 1991). Similar results were found by Burke and colleagues (1994). They investigated the prevalence of depression in mothers of

adolescents with IBD and their results indicated that 51 per cent had a history of depression. Furthermore, these mothers were significantly more likely to present with obsessive-compulsive symptoms than mothers of children with cystic fibrosis (Burke *et al.,* 1994). Other studies have suggested that disease exacerbation and the associated symptoms are positively correlated with parental distress (Tojek *et al.*, 2002; Wood *et al.*, 1989).

A more recent study by Greenley and Cunningham (2009) investigated the impact of disease activity in children on parents' overall quality of life (QOL). Parental QOL was also compared with a normative sample. Correlation analyses indicated that as disease activity worsened, parental QOL decreased specifically in physical functioning and mental health domains. Overall, however, parental QOL was not significantly different from the normative sample. The authors also completed regression analyses to investigate whether patient QOL and disease activity predicted parental QOL in physical and mental health functioning. The results indicated that 10 per cent and 15 per cent of the variance between parental QOL (physical and mental health respectively) was predicted by disease activity. Similarly, parental mental health contributed to 14 per cent of the variance in terms of child QOL. These findings indicate that parental mental health may be predictive of children's quality of life in the IBD population (Greenley & Cunningham, 2009).

Summary

Parents of children with chronic medical conditions such as IBD may be at increased risk of psychological dysfunction. There is some indication that parental distress and child distress are interlinked, although it is unclear as to what the causal direction of this link may be. It seems plausible that parents who have a distressed child in pain may themselves become distressed but also that if a parent's emotional well-being is compromised, this may impact negatively upon the child's functioning. To date, methodological inadequacies in the current literature, such as small sample sizes, use of non validated measures and failure to report information such as effect sizes and statistical power, limit the conclusions that can be drawn. Furthermore, there have been few studies which have attempted to identify predicting variables for both

parent and child dysfunction. Of those that do exist, few have been conducted with a British population and none, to date, have focused on a Scottish population.

1.6 Parental Overprotection

The development of autonomy from parents and identification with a peer group are important tasks within adolescence. Balancing autonomy and individuation with appropriate boundaries and parental control are important parts of this developmental stage (Holmbeck & Shapera, 1999). Within the context of chronic illness, autonomy can be difficult to achieve, and factors such as parental overprotection and subsequent conflicts are common difficulties for adolescents with chronic conditions (Anderson & Coyne, 1993),

Parental overprotection has been defined as a characteristic of a parent who is "...highly supervising and vigilant...has difficulties with separation from the child...discourages independent behaviour and...is highly controlling..." (Thomasgard & Metz, 1993, p68)

Overprotection in adolescence can compromise both the normative strive for autonomy and successful transition into adulthood, leading to behavioural difficulties, as highlighted earlier in this chapter (Holmbeck, 2002). Blum and colleagues (1991) also suggested that overprotection from parents can negatively affect self esteem and anxiety in adolescents with chronic illness. This is suggested to be related to the conflict between parent and child regarding treatment adherence and decision making (Anderson & Coyne, 1993).

A study by Wall (2004) indicated that the need for autonomy can either facilitate *or* hinder adherence to treatment in adolescents with diabetes. Over-protection from parents can ensure that treatment is adhered to thus promoting physical well being, however, this can be in conflict with the adolescent's strive for autonomy and may result in conflict. Similarly, increased autonomy may provide the adolescent with increased responsibility for treatment regimes and this may be in conflict with the adolescent's desire for peer acceptance and may thus lead to reduced adherence and

have implications on their long term health (Wall, 2004). Wall (2004) suggested that autonomy should be an important consideration in transition planning for children with chronic conditions entering adolescence to improve adherence whilst allowing for the development of autonomy.

A study by Palermo and colleagues (2007) investigated the relationship between autonomy and family functioning on adolescents with recurrent headaches. Their findings suggested that autonomy and family functioning were significant predictors for headache-related difficulties. The authors indicated that addressing underlying issues of autonomy could be beneficial in reducing functional complaints, such as recurrent headache (Palermo *et al.*, 2007).

To date, the limited number of studies which have examined parent-child conflict and associated issues of over-protection and autonomy in the context of chronic medical conditions have focused on conditions such as diabetes (Dashiff *et al.*, 2008; Hanna & Guthrie, 2003; Seiffge-Krenke, 1998; Wall, 2004), cancer (Morris *et al.*, 1997; Rait *et al.*, 1992) asthma (Parker & Lipscombe, 1979) and spina-bifida (Blum *et al.*, 1992; Coakley *et al.*, 2002). It has been suggested that within such conditions, non-adherence to treatment regimes can be life threatening and issues of parental overprotection are much more pertinent due to increased parental anxiety and fear around adolescent self management of treatment regimens (Dashiff *et al.*, 2008). As such, the majority of studies in this area have focused on such life threatening or life limiting conditions. Less attention has been paid to the issues of autonomy and overprotection in conditions such as IBD, despite the fact that IBD has a peak onset in adolescence. As discussed, autonomy has been highlighted as having an impact on HRQOL in IBD (Loonen *et al.*, 2002) and the importance of autonomy in the successful negotiation of adolescence has also been highlighted. As such, it is plausible that adolescents with IBD and their parents may also be experiencing difficulties with the attainment of autonomy. Given the lack of research in this area, it is considered an appropriate undertaking to assess the influence of autonomy on the HRQOL of adolescents with IBD.

1.7 Rationale for current study

There have been few studies, to date, which have examined the predictive influence of factors such as psychological functioning, parental psychological functioning, gender and overprotection on health-related quality of life outcomes in adolescents with IBD. This study aims to increase current understanding of factors which account for a significant amount of the variance in HRQOL outcomes for this population.

Parents are recognised as having significant influence on decision making and treatment planning in paediatric illness populations, yet research has suggested that agreement between parent and self-report is often poor. Further exploration of agreement between parent and self-report on HRQOL has been called for. As such, a secondary aim of this research is to examine agreement between parent and self report on a measure of HRQOL for adolescents with IBD.

The current paediatric IBD literature has suggested that there may be gender differences in HRQOL outcomes. However, only one paper, to date, has examined this. Research in other paediatric chronic conditions has suggested that females report lower HRQOL than males. This is in line with findings from the adult IBD population but in contrast to the one study conducted with a paediatric population. Given the lack of research and conflicting findings in this area, it was considered appropriate to examine gender differences in the current study, as a supplementary aim.

1.8 AIMS

Primary Aim: To examine the predictive validity of factors such as age, gender, individual psychological functioning and parental psychological functioning that have been associated with health related quality of life outcomes in adolescents with IBD.

Secondary Aim: To investigate agreement between parent reported and self reported Health Related Quality of Life in adolescents with IBD.

Supplementary Aim: To examine gender differences in HRQOL outcomes in adolescents with IBD.

1.9 Research Questions:

1. Which factors predict HRQOL outcomes in adolescents with IBD?

2. Are parents able to rate the HRQOL of their children with IBD across physical and emotional domains?

1.10 MAIN HYPOTHESES

1. Demographic factors (i.e. gender and age), individual psychosocial factors (i.e. anxiety, depression, self esteem and parental over-protection) and parental psychosocial factors (i.e. parental depression and anxiety) will each significantly account for, and add to, the variance in HRQOL outcomes for adolescents with IBD.

2. Parent versus self report agreement on HRQOL outcomes will be stronger on physical domains than on emotional domains in adolescents with IBD.

3. Significant gender differences will exist in overall HRQOL scores for this population, with females reporting poorer HRQOL than males.

2: METHODOLOGY

2.1 Design

This study implemented a cross-sectional design. Correlational design was used to investigate the relationship between psycho-social functioning (i.e. anxiety, depression and self esteem) and parental overprotection on HRQOL in adolescents with IBD. Correlational design was also implemented to assess level of agreement between proxy and self report on HRQOL. Regression analysis was used to investigate whether psycho-social factors predicted HRQOL outcomes.

2.2 Participants

Adolescents (aged 13-17) with a definitive diagnosis of inflammatory bowel disease (IBD) and their parents were identified via the Gastroenterology outpatient database at the Royal Hospital for Sick Children, Edinburgh (RHSC). This database holds demographic and diagnostic information on all children referred to the clinic. Clinic lists are compiled several months in advance, however, patients are often 'added on' to these lists at short notice. Two weeks in advance of each clinic the lists were checked for any adolescent aged 13-17 years due to attend clinic. These names were then cross-referenced with the Gastroenterology database to check whether they met inclusion criteria. This process was completed for all adolescents due to attend clinic between September 2008 and May 2009, the period of data collection.

Inclusion criteria:

- A definitive diagnosis of either IBD (including Indeterminate Colitis, Ulcerative Colitis or Crohn's Disease)
- Prospective participants aged between 13-18 at the time of the clinic appointment

Exclusion criteria:

- Inpatients during the data collection period
- Having an intellectual disability which compromised capacity to give informed consent

- Lack of adequate command of English which compromised capacity to give informed consent
- Lack of a definitive diagnosis of IBD.
- Any prospective participant whom the Consultant Gastroenterologist deemed unsuitable to be included in this research based on information not included on the database such as familial, behavioural or communication difficulties.

2.3 Procedure

Two information leaflets were designed (Appendix 1) which outlined the background to the research, the procedure involved, the confidentiality policy and contact details of the researcher for further information. One information leaflet was designed for adolescent participants and one information leaflet was designed for parents/carers (for ease of reference from hereon, the term parents will refer to parents or carers). An invitation letter (see Appendix 1) and information leaflets were sent out to all participants and their parents who fulfilled the inclusion criteria. The researcher sent letters to prospective participants one-two weeks in advance of clinic appointments which were identified via clinic lists. Invitation letters were countersigned by the medical consultant responsible for the medical care of all participants. If a cancelled or non attended appointment was rescheduled, further copies of the information leaflet and another invitation letter was sent out in advance of the next clinic appointment.

All prospective participants and their parents were approached whilst waiting to see the medical team at the weekly Gastroenterology clinic at the Royal Hospital for Sick Children, Edinburgh. They were provided with a consent form (see Appendix 1) and further copies of the information leaflets to ensure they had received, read and understood the information. Each participant and their parent were then asked to confirm or decline to take part in the research by completing the consent form.

If a prospective participant declined to participate, they were asked to complete a consent form confirming that they did not wish to take part in the research study. This then ensured that those who had declined were not approached in the future.

Both parent and adolescent were required to consent before proceeding due to the comparative nature of the study.

If a patient attended the clinic without their parent, the adolescent was approached and given an opportunity to participate. Copies of parental study questionnaires, a consent form and a pre-paid return envelope were then given to the adolescent to pass on to their parents.

When informed consent was confirmed, each participant and their parent were given a set of study questionnaires to complete. They were also given instructions for the correct completion of questionnaires. A handout of these instructions was also provided (Appendix 1). Participants were made aware that the researcher would be available throughout the clinic period if they had any further questions. They were also asked to return the questionnaires to the researcher prior to leaving the outpatients department. Pre-paid envelopes were made available if they were unable to complete the questionnaires during clinic time.

Postal returns were monitored and reminder letters with duplicate questionnaires were sent out if replies had not been received within six weeks. Alternatively, if postal returns had not been received and the participant was due to attend clinic a second time during the data collection period, they were approached again and given another opportunity to take part in the research. Please see Figure 2 for diagrammatical illustration of the research procedure.

Following completion of questionnaires, the consent form was removed to ensure anonymity and questionnaires were coded with a unique identifier. This code allowed identification of participants to the researcher alone. Identification was only necessary in the event of responses on the questionnaires indicating clinically significant depression, suicidal ideation or intent. It was arranged that if any responses indicated suicidal intent, participants would be asked to remain in the clinic and assessment with appropriate emergency psychiatric teams would be arranged.

If postal returns indicated clinically significant responses, the unique identifier would be used to identify the participant. The participant would be contacted directly to discuss responses. If suicidal ideation or intent was indicated on postal responses, the participant and/or the parent would be contacted in the first instance to discuss these concerns in more detail and to ascertain whether further action such as referral to the local crisis response team was necessary. In all instances of responses indicating suicidal intent, the patient's GP would be contacted.

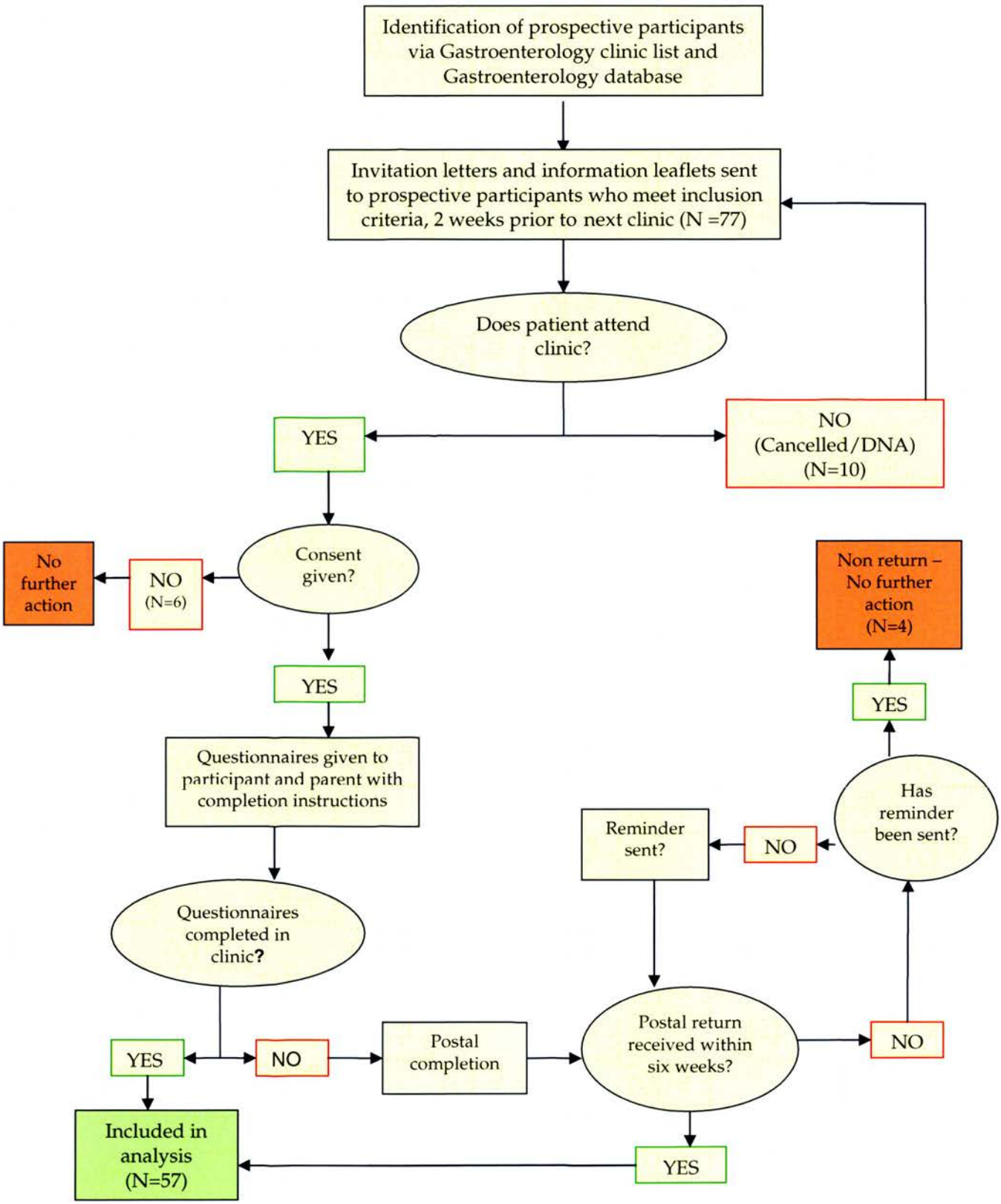

Figure 2: Research Procedure

2.4 Power calculation

In order to reliably assess the extent to which individual and parental factors predict HRQOL, multiple regression analysis was undertaken. Green (1991) suggested that when undertaking regression analysis a sample size of 50 + 8k (whereby k is the number of predictors) is sufficient in order to detect a moderate effect size at the β=0.8 level, should one exist. In this study, the predictors are:

1. Demographic factors i.e. gender, age
2. Individual psychological factors i.e. depression, anxiety and self-esteem
3. Parental psychological factors i.e. depression, anxiety, maternal and paternal overprotection.

Thus giving a total of nine predictors. Green's calculation would suggest that a sample size of (50 + (8x9) =122) is sufficient to detect a moderate to large effect size. However, previous studies in both the general paediatric population and the IBD population have suggested the predictive influence of individual and parental factors (e.g. De Boer *et al.*, 2005). Thus by combining individual and parental factors as well as demographic factors we then have three predictors, to be entered into the regression model in three blocks as suggested by Cohen (1991). Thus three predictors would suggest a sample size of 50 + (8x3) = 74 is sufficient to detect a moderate effect size. Sample size was also guided by previous research in this area. One of the few studies in the adolescent IBD population which examined the predictive influence of psychological functioning on HRQOL found medium to large effect sizes following regression analysis using a sample size of N=40 (De Boer *et al.*, 2005). Cohen (1988) suggested small, medium and large effect sizes for R^2 values of 0.02, 0.13 and 0.26 respectively (Miles & Shevlin, 2001). In the study by De Boer and colleagues, R^2 values ranged from 0.21-0.65, indicative of medium to large effect sizes. This would suggest that a sample size of between N =40-N=74 should be sufficient to detect a medium effect size, should one exist, using multiple regression analysis with this population.

Given that an additional aim of this study is to examine the difference between males and females with IBD, independent *t*-test analysis will also be undertaken. Cohen

(1991) suggested that when undertaking independent *t*-test analysis, in order to detect a medium effect size at the β=0.8 level, a minimum sample size of $N = 64$ is required (Cohen, 1991). Previous literature in this area, has suggested that medium to large effect sizes have been found in the paediatric IBD population when independent *t*-test analysis has been undertaken when using a sample size of $N = 40$ (e.g. De Boer *et al.*, 2005). Recruitment was therefore guided by the numbers suggested by both Green (1991) Cohen (1988; 1991) and by previous research in this area (e.g. De Boer *et al.*, 2005), and a sample size of between $N=40$ and $N=74$ was aimed for, although recruitment was also influenced by attendance rates

2.5 Measures

Assessment included completion of questionnaires by both participants and one of their parents.

1. Demographic information form (Appendix 2).

A brief form was designed to collate information on gender, age, medical diagnosis plus details of any medication being taken, for each adolescent participant. Patients were also asked to rate how well they had been feeling over the past week, using a 100mm visual analogue scale. On the scale the left end point was 0 (I have been feeling very unwell) and the right end point was 100 (I have been feeling very well with no symptoms). Wellness was measured as distance from the left end point. Visual analogue scales have been found to be a reliable and valid means of measuring subjective ratings of disease severity and well being in illness populations (Lucas *et al.*, 2003). Time constraints on clinic time meant that standardised measures of disease severity could not be completed by the medical team. A visual analogue scale was therefore chosen as an appropriate alternative method of assessing current well being for the purpose of this study.

2. Pediatric Quality of Life Inventory (PedsQL™) (UK) Version 4.0 Teenagers Report (ages 13-18). (Varni, 1998) (Appendix 2).

The PedsQL™ (Teenagers Report) is a generic 23-item measure of health related quality of life for those aged 13-18 years. The PedsQL™ includes parent/proxy

report and self report across domains of physical (8 items), emotional (5 items), social (5 items) and school functioning (5 items). Items on proxy and self report are worded in the third and first person tense respectively.

Items are scored via a five-point Likert scale and are reverse scored as follows:

'Never a problem' = 100

'Almost never a problem' = 75

'Sometimes a problem' = 50

'Often a problem' = 25

'Almost always a problem' = 0

Scaled scores on the PedsQL are calculated by dividing the total score by the number of items in each domain (physical (maximum of 8-items), emotional, social and school (maximum of 5 items each). Total scaled scores are calculated by summing all responses and dividing by number of items answered (maximum of 23 items). As well as domain and scaled scores a 'psycho-social' scaled score is calculated by summing all scores on emotional, social and school domains and dividing by total items scored (maximum of 15 items). The calculation of scaled scores in this way allows for missing data to be accounted for across each of the subscales (Varni *et al.*, 2001).

The original generic scale of the PedsQL™ was developed with an American population and this was translated and validated for use with a UK population (Upton *et al.*, 2005). Internal reliability of the UK version was found to be $\alpha > 0.70$[2] for both self and proxy report (Upton *et al.*, 2005). Upton and colleagues also found that the UK version of the PedsQL ™ had good discriminate validity. These findings were similar to the psychometric properties of the original PedsQL™ ($\alpha = 0.83$ child, $\alpha = 0.88$ parent/proxy).

[2] Cronbach's alpha scores of between $\alpha = 0.5$-0.7 indicate moderate to good levels of internal consistency, an accepted measure of reliability (Pallant, 2001)

As discussed, the PedsQL includes an 'emotional' sub-scale which assesses the individual's emotional well-being. Given that the main aim of this study is to examine the extent to which psychological well-being influences and predicts HRQOL, it was important to consider that the emotional scale may confound results i.e. it would be expected that a participant scoring low on the emotional sub-scale would also score high on depression and anxiety scales. In order to control for this potential confound, the emotional sub-scale was removed from the overall total scaled score for regression analysis.

3. Spence Children's Anxiety Scale (SCAS) (Spence, 1998*)* (Appendix 2)**.**

This is a widely used 38-item measurement of anxiety used with children and adolescents. Items are positively worded e.g. "I am scared of insects or spiders". Seven positive items are also included but are not scored e.g. "I am proud of my school work".

Items are scored using a four-point Likert scale in relation to how often the respondent experiences each of the items and are scored as follows:

Never - 0

Sometimes - 1

Often - 2

Always - 3

Items on the SCAS are allocated to six sub-scales linked to DSM-IV criteria for anxiety disorders or totalled to give a total anxiety score (Spence, 1998). These subscales are: generalised anxiety, social phobia, separation anxiety, agoraphobia, specific phobia and obsessive compulsive disorder. For the purpose of this research, total anxiety scores were calculated.

Good levels of internal consistency have been found in adolescent samples for total anxiety scores ($\alpha = 0.93$) on the SCAS. Test re-test reliability for total anxiety score on the SCAS has also found to acceptable ($\alpha = 0.63$). Convergent and divergent validity have also been found to be acceptable for the SCAS in comparisons with other measures of anxiety and measures of depression (Spence *et al.*, 2003).

4. Rosenberg Self Esteem Scale (RSES) (Rosenberg, 1965) (Appendix 2).

The RSES is a widely used 10-item measure of global self esteem which is validated for use with adolescents and adults aged 11+ (Rosenberg, 1965). The scale consists of five positively worded items and five negatively worded personal evaluative statements e.g. "All in all I am inclined to feel like a failure" and "I take a positive attitude towards myself" (Butler & Gasson, 2005). Items are scored on a four-point Likert scale (0-3) from strongly agree to strongly disagree. Reverse scoring is implemented for positive items. Higher scores indicate better self esteem. Cut-off scores have been suggested in an adolescent population with scores below 21 indicative of low self-esteem (Bagley *et al.*, 1997).

The RSES has been found to have good internal consistency ($\alpha = 0.74$) and good test re-test reliability ($\alpha = 0.77$) at one year follow up in an adolescent population (McCarthy & Hoge, 1982). The RSES has also been found to have acceptable construct validity (Bagley & Mallick, 2001; Robins *et al,* 2001).

5. Beck Depression Inventory (BDI) (Beck, 1996) (Appendix 2).

The BDI-II is a widely used and well validated 21-item measure of depressive symptoms. Items are positively worded for common symptoms of depression experienced in the two weeks prior to completion. Each item has four statements which are scored on a four-point Likert scale (0-3) e.g. For the 'guilty' item responses are as follows:

I don't feel particularly guilty - 0
I feel guilty over many things I have done or should have done – 1
I feel guilty most of the time - 2
I feel guilty all the time - 3

Scores are assigned to one of four categories of severity based on population norms. These four categories are: minimal depression (0-13), mild depression (14-19), moderate depression (20-28) and severe depression (29-63) (Beck, 1996).

The BDI has been found to have high reliability, internal consistency (α = 0.92-93) with an outpatient and non patient normative sample respectively. High construct and content validity has also been found with the BDI-II in the assessment of depression in adolescents and adults aged 13 years upwards (Beck, 1996).

5. Parental Bonding Instrument (PBI) (Parker *et al.*, 1979) (Appendix 2).

The PBI is a 25-item measure of perceived parenting. Items have been separated via factor analysis into two subscales of 'care' and 'overprotection' (Shams & Williams, 1995). The term 'care' relates to parental warmth and affection whilst the term 'overprotection' relates to parental encouragement of autonomy. On the PBI, 13 items relate to 'care' and 12 items relate to 'overprotection'. Each respondent completes two identical forms, one for their mother and one for their father.

Items are scored on a four-point Likert scale (very like to very unlike) to indicate the extent to which each statement is relevant for each parent. Positive 'care' items such as, "Let me go out as often as I wanted" are scored (0-3) with higher scores reflective of higher care. Negative 'care' items such as, 'did not seem to understand what I needed or wanted' are reverse scored e.g. a response of 'very unlike' would attain a score of 3. Positive 'overprotection' items such as "Was over protective of me" are reverse scored e.g. a response of 'very unlike' would attain a score of 3. Negative 'overprotection' items are positively scored e.g. items such as 'Let me decide things for my self' a score of 'very unlike' would attain a score of 0. Lower scores are reflective of lower overprotection and higher autonomy. Total care and overprotection scores are calculated for each parent. Optimal parenting is seen as high 'care' scores and low 'overprotection' scores. Lower 'care' scores are indicative of neglect and high 'overprotection' scores indicate intrusive parenting and reduced autonomy (Parker *et al.*, 1979).

High reliability, validity and factor structure have been found for the PBI (Arrindell *et al.,* 1989). Although originally designed as a retrospective, adult assessment of parental relationships, the PBI has been validated for use with adolescent samples

(Cubis *et al.*, 1989). A study by Shams & Williams (1995) demonstrated good internal consistency on both the care dimension ($\alpha = 0.83$) and the overprotection dimension ($\alpha = 0.84$) in a group of Scottish adolescents.

6. Beck Anxiety Inventory (BAI) (Beck, 1990) (Appendix 2).

The BAI is a widely used 21-item measure of anxiety for use with an adult population. Each item relates to different physiological symptoms of anxiety such as 'face flushed' and 'feelings of choking'. Respondents are asked to indicate how frequently they have experienced each symptom over the previous week across a four-point Likert scale as follows:

Not at all - 0
Mildly - 1
Moderately - 2
Severely - 3

Total anxiety scores are calculated by summing item scores (range 0-63). Cut off scores have been identified for minimal (0-9), mild (10-19), moderate (20-29) and severe (30+) anxiety (Beck, 1990).

The BAI has been found to have high reliability, internal consistency and high construct and content validity in the assessment of anxiety in adults (Beck, 1990).

2.6 Quality Assurance

This study was submitted to the Lothian Research Ethics Committee for ethical review and to the NHS Lothian Research and Development department for management approval. Main ethical considerations included;

- Ensuring that there were clear procedures in place to respond to participants whose responses on questionnaires were indicative of suicidal ideation
- Ensuring that all participants were informed of the circumstances when confidentiality may need to be broken

- Ensuring that all participants were provided with the information leaflets prior to attending clinic and that informed consent was then obtained, in person, at the relevant clinic appointment to ensure that both participants and their parents were willing to be take part in the study

Ethical approval was granted following acknowledgement that all ethical considerations had been adequately addressed in the research protocol. NHS Lothian management approval was granted subject to ethical approval. (Please refer to Appendix 3 for appropriate documentation).

2.7 Statistical Analysis

Subsequent to the completion of data collection, Pearson's correlation analysis, multiple regression analysis and independent sample *t*-tests were undertaken using SPSS version 17.0.

3: RESULTS

3.1 Exploratory analysis

Prior to statistical analysis being completed, the data was checked to assess whether assumptions for normality were met. Skewness and kurtosis scores were converted to *z*-scores and the majority of scores were found to be below the upper limit of 3.29, suggestive of normality (Field, 2005) (See Appendix 4). Scores which significantly deviated from normality, i.e. with *z* scores >3.29 were found on measures of adolescent depression (BDI) and anxiety (SCAS), PedsQL physical scaled score (teenagers), PedsQL social scaled score (teenagers) and PedsQL total scaled scores (teenagers) (when emotional subscale was omitted). Skewed data was transformed according to the shape of the distribution, i.e. logarithm, square root and reflect and logarithm (Tabachnick & Fidell, 1996) (see Appendix 4). Transformed variables were then converted to *z* scores to assess normality (see Appendix 4). Transformed scores were found to be below the cut-off of 3.29, thus normal distribution was assumed and parametric analysis was undertaken. Level of significance was set at $p<0.05$.

3.1.1 Overview of analyses

The first aim of this study was to investigate the predictive influence of adolescent and parental psycho-social factors and HRQOL scores on the Pediatric Quality of Life Inventory (PedsQL™). For this analysis, Pearson's correlations and multiple regression analyses were run.

The second aim of this research was to investigate agreement between self report and parent proxy report on the PedsQL measure of HRQOL. Pearson's correlations were implemented to evaluate agreement between self and parent reported HRQOL across the six subscale scores on the PedsQL™, physical, emotional, social, school, psycho-social and total overall HRQOL score.

A further aim was to investigate gender differences in HRQOL outcomes, for which independent sample *t*-tests were conducted

3.2 Descriptive Statistics

A total of 77 prospective participants were identified via clinic lists. Invitations to participate in the study were posted to prospective participants due to attend clinic between September 2008 and May 2009. Of these, 57 questionnaires were completed (a return rate of 74 per cent). Of the remainder, ten did not attend their clinic appointment (12.9 per cent), six declined to participate (7.8 per cent) and four (5.2 per cent) failed to return their questionnaires by post.

3.2.1 Demographic details

The mean age of participants was 14.7 (SD, 1.2), range 13-17 years with 36 males and 21 females. Table 1 outlines disease type for all participants.

Table 1: Disease Type of participants

Disease Type	**n**	**Percentage of sample**
Ulcerative Colitis	11	19.3%
Crohn's Disease	43	75.4%
Indeterminate Colitis	3	5.3%
TOTAL	57	100%

3.2.2 Descriptive statistics for measures used

Descriptive statistics (mean scores and standard deviations) were calculated for all measures used i.e. HRQOL (Pediatric Quality of Life Inventory - PedsQL), depression (Beck Depression Inventory - BDI-II) adolescent anxiety (Spence Children's Anxiety Scale- SCAS), parental anxiety (Beck Anxiety Inventory - BAI), self esteem (Rosenberg Self-Esteem Scale - RSES) and parental overprotection (Parental Bonding Instrument (PBI). These scores are outlined in Table 2, below.

As outlined in chapter 2, cut-off scores for the BDI-II suggest that scores <10 are indicative of 'minimal depression' (Beck, 1996). Mean scores on both parent and adolescent BDI scores in this sample were <10 suggesting that this sample were, on average, in the minimally depressed range. BAI scores <7 are indicative of minimal anxiety and scores between 8-15.1 are considered to indicate 'mild anxiety' (Beck, 1990). Mean scores on the BAI (parent completed) were just above the cut-off, indicating that parents in this sample typically reported mild anxiety.

On the PedsQL, no cut-off scores exist and higher scores are indicative of better HRQOL. In table 2, mean scores across all subscales of the PedsQL for teenager and parent report ranged from 62.6-79.8/100 indicating that this sample, as a whole, reported fairly good HRQOL.

On the SCAS, mean total scores in the normal population are estimated to be around 25.04 for non-clinical controls (Yule, 1994). Mean scores on the SCAS in this sample were 16.9 suggestive that this group, as a whole, were not significantly anxious.

Self-esteem scores on the RSES less than 21 are considered to reflect low self esteem, with higher scores reflective of high self esteem. The mean score on the RSES in this sample was 24.5/30 suggestive that the group, on average, had fairly high self esteem.

On the Parental Bonding Instrument (PBI) cut off scores for maternal protection scores are 13.5 and for paternal protection are 12.5. In this sample, mean maternal protection scores were 10.0 and father protection scores were 7.7, both below the cut-off for what is considered 'high protection' and indicative of over-protective parenting (Parker *et al.*, 1979).

Adolescents were also asked to rate how well they were feeling in relation to disease symptoms using a visual analogue scale 0-100mm, whereby 100 indicated 'I have been feeling very well and 0 indicated 'I have been feeling very unwell'. The mean

'wellness' score for all participants was 72.9 (SD 27.1) range 0-100. These results indicate that, overall, the participants in this study were in good health.

Table 2: Mean and Standard Deviation scores for all measures

Measure	Subscale	Respondent	Mean (SD)
1. PedsQL	Physical	Teenager	79.8 (19.6)
		Parent	75.1(19.9)
	Emotional	Teenager	75.7 (18.8)
		Parent	62.6 (21.7)
	Social	Teenager	86.6 (20.0)
		Parent	79.7 (20.3)
	School	Teenager	64.5 (25.1)
		Parent	64.3 (25.0)
	Psycho-social	Teenager	76.4 (17.1)
		Parent	68.8 (18.9)
	TOTAL	Teenager	77.7 (16.8)
		Parent	70.9 (18.4)
2. BDI-II		Teenager	7.1 (9.7)
		Parent	9.8 (8.5)
3. RSES		Teenager	24.5 (5.9)
4. SCAS		Teenager	16.9 (12.7)
5. BAI		Parent	7.4 (7.9)
6. PBI			
	Maternal Overprotection	Parent	10.0 (6.3)
	Paternal Overprotection	Parent	7.7 (5.0)

3.3 Hypotheses Testing

Hypothesis 1 Demographic factors (i.e. gender and age), individual psychosocial factors (i.e. anxiety, depression, self esteem and parental over-protection) and parental psychosocial factors (i.e. parental depression and anxiety) will each significantly account for, and add to, the variance in HRQOL outcomes for adolescents with IBD.

Correlational analysis was undertaken to assess the relationship between demographic (i.e. age and gender) individual factors (i.e. depression, anxiety, self-esteem and parental over-protection) and parental factors (i.e. parental depression and anxiety) and health-related quality of life in adolescents with IBD. Gender, adolescent depression, anxiety and self-esteem were found to be significantly associated with HRQOL outcomes for adolescents with IBD. Parental depression and anxiety were also found to be significantly associated with HRQOL in adolescents with IBD. Age, maternal and paternal overprotection were not found to be significantly associated with HRQOL outcomes. Correlational analysis results can be referred to in Table 3, below.

Table 3: Correlation analysis results

Construct	Measure	Pearson's *r*	Significance
1. Adolescent depression	BDI-II	$r = 0.44$	$p < 0.01$
2. Adolescent anxiety	SCAS	$r = 0.54$	$p < 0.01$
3. Adolescent self-esteem	RSES	$r = 0.40$	$p < 0.01$
4. Maternal overprotection	PBI	$r = 0.20$	$p > 0.05$(NS[3])
5. Paternal overprotection	PBI	$r = 0.16$	$p > 0.05$ (NS)
6. Parental depression	BDI-II	$r = 0.35$	$p < 0.01$
7. Parental anxiety	BAI	$r = 0.35$	$p < 0.01$
8. Gender		$r = 0.36$	$p < 0.01$
9. Age		$r = -1.13$	$p > 0.05$ (NS)

When undertaking regression analysis, Tabachnick and Fidell (1996) recommend against the inclusion in multiple regression analysis of two variables with bivariate correlations greater than or equal to 0.7. (Tabachnick & Fidell, 1996). As outlined in Table 2, none of the significant bivariate correlations in this study were ≥ 0.7 and as such, all significant variables were entered into the regression model. Given that there were sound theoretical reasons for entering grouped variables into the regression equation (i.e. evidence to suggest that gender, individual psychological functioning and parental psychological functioning was likely to predict HRQOL) hierarchical regressional analysis was undertaken. The dependent variable was total scaled score on PedsQL (i.e. physical, social and academic functioning). Predictor variables were entered into the regression equation in three blocks. Gender was entered into the first block, individual (adolescent) factors i.e. depression, anxiety

[3] NS – Non significant result

and self-esteem were entered into the second block and parental factors (parental depression and anxiety) were entered into the third block of the regression equation. Due to the small sample size, adjusted R^2 values were reported (Tabachnick & Fidell, 1996).

Gender was found to account for 10.8 per cent of the variance in findings (adjusted $R^2 = 0.108$). When individual factors of anxiety, depression and self-esteem were entered into the equation, the model as a whole accounted for 25.1 per cent of the variance (Adjusted $R^2 = 0.251$) i.e. an additional 14.3 per cent of the variance in findings was attributable to individual psychological functioning. This contribution was found to be significant [$F (4, 34) = 4.19$, $p < .01$]. With parental factors entered into the equation, the model accounted for 24.7 percent of the variance (Adjusted $R^2=0.247$). Parental factors did not add to the total variance when gender and individual factors were controlled for. The regression model as a whole, i.e. all three blocks of variables, was found to be significant [$F (6, 32) = 3.07$, $p < .05$]. The individual contribution of each independent variable in the regression model was then examined. As outlined in Table 4, none of the independent variables in each of the three blocks, made a significant, unique contribution to the regression model.

Table 4: Regression summary statistics for individual contribution to the regression model

Independent Variable	**Beta (*B*)**	***t***	**Significance**
Gender	0.10	0.617	$p>0.05$ (NS)
Anxiety	0.31	1.6	$p>0.05$ (NS)
Depression	0.14	0.69	$p>0.05$ (NS)
Self-esteem	0.06	0.31	$p>0.05$ (NS)
Parental anxiety	0.12	0.50	$p>0.05$ (NS)
Parental depression	0.9	0.41	$p>0.05$ (NS)

Hypothesis 2: Females with IBD will report significantly lower HRQOL scores than males with IBD.

Gender split for the IBD group was 36 males and 21 females. Independent-sample *t*-tests were conducted to examine whether there were gender differences across all domains of the PedsQL for adolescents with IBD. Mean scores for females were consistently lower than males across all domains. Significant differences were found on physical domains, ($t(28.8) = 2.9$, $p<0.01$), social domains ($t(25.6) = 2.7$, $p<0.05$), psycho-social domains ($t(28.4) = 2.3$, $p<0.05$) and total scaled scores ($t(28.4) = 2.7$, $p<0.05$). Effect sizes (*d*) were also calculated for each domain using Cohen's *d* (Cohen, 1992). Based on Cohen (1992), an effect size of 0.2 is considered a small effect, 0.5 a medium effect and 0.8 a large effect. Medium to large effect sizes were found on all domains with the exception of school which had a small effect size (0.2). Independent *t*-test results and effect sizes are outlined in Table 5 below.

Table 5: Independent sample *t*-test scores across all domains of the PedsQL™ for males and females with IBD

Domain	Male Mean (SD)	Females Mean (SD)	*t*-scores (df)	Sig	Effect size (*d*)
Physical	85.8 (12.1)	69.4 (20.3)	2.9 (28.8)	$p<0.01$	0.9
Emotional	79.0 (14.7)	70.0 (23.5)	1.6 (29.2)	$p>0.05$ (NS)	0.5
Social	92.6 (12.5)	76.2 (25.9)	2.7 (25.6)	$p<0.05$	0.8
School	67.9 (26.5)	59.5 (23.4)	1.4 (55)	$p>0.05$ (NS)	0.3
Psychosocial	80.9 (12.6)	69.1 (21.1)	2.3 (28.4)	$p<0.05$	0.7
TOTAL	82.6 (12.1)	69.4 (20.4)	2.7 (28.4)	$p<0.05$	0.8

Hypothesis 3: Parent versus self report agreement on HRQOL outcomes will be better on physical domains and poor on emotional domains in adolescents with gastrointestinal disorders.

Agreement between parent reported and self reported HRQOL was found to be moderate to good across all domains of the PedsQL with correlations ranging from 0.47-1.0. Agreement is typically rated as poor when correlations are less than 0.3, moderate when correlations fall between 0.3 and 0.5 and good when correlations are greater than 0.5 (Eiser & Morse, 2001). These findings are outlined in Table 6 below.

Table 6 Agreement between self report and parent report on PedsQL™ in adolescents with gastrointestinal disorders.

Subscale	Teenager	Parent	Pearson's *r*	Level of agreement
Physical	79.8 (19.6)	75.1 (19.9)	0.7	Good
Emotional	75.7 (18.8)	62.6 (21.7)	0.5	Moderate-good
Social	86.6 (20.0)	79.7 (20.3)	0.6	Good
School	64.5 (25.1)	64.3 (25.0)	0.9	Good
Psychosocial	76.5 (17.1)	68.8 (18.9)	0.6	Good
TOTAL	77.7 (16.8)	70.9 (18.4)	0.7	Good

4: DISCUSSION

4.1 Overview

The main aim of this research was to examine factors which may predict the Health Related Quality of Life (HRQOL) of Scottish adolescents with inflammatory bowel disease. The second aim was to evaluate agreement between parents and adolescents with IBD on all domains of HRQOL. Cross-sectional analysis of adolescents with IBD and their parents was completed at a paediatric gastroenterology outpatient clinic over a period of nine months. Measures of HRQOL, depression, anxiety, self esteem and parental overprotection were completed. This chapter aims to examine the findings in relation to the research hypotheses and provide an overview of the possible clinical implications of these findings. Furthermore, this section will examine the limitations that exist within this research and discuss possible areas where further research may be valuable.

4.2 Summary of Main Findings

Hypothesis 1: Demographic factors (i.e. gender and age), individual psychosocial factors (i.e. anxiety, depression, self esteem and parental over-protection) and parental psychosocial factors (i.e. parental depression and anxiety) will each significantly account for, and add to, the variance in HRQOL outcomes for adolescents with IBD.

Gender, anxiety and depression as well as parental anxiety and depression were found to be significantly inversely correlated to HRQOL total scores. Similarly, self-esteem scores were found to be positively correlated with total HRQOL scores. When these factors were entered into the regression model, the model as a whole (i.e. all three blocks cumulatively) significantly added to the variance in findings. When the contribution of gender was controlled for, individual psychological functioning significantly added to the variance in findings. When gender and individual psychological functioning were controlled for, parental psychological functioning was not found to significantly add to the variance in findings. Similarly, when the unique contribution of each individual variable was assessed, no significant

contribution was found. This would suggest that individual psychological functioning (i.e. anxiety, depression and self-esteem cumulatively) predicts HRQOL outcomes in adolescents with IBD.

These results are in line with previous findings in the adult and paediatric populations which have suggested that individual psycho-social functioning is an important predictive factor in HRQOL outcomes in the IBD population (De Boer *et al.,* 2005; Guthrie *et al.*, 2002; Larsson *et al.*, 2008; Loonen *et al.,* 2002; Pizzi *et al.,* 2006).

Those who experience relapse or exacerbation of symptoms are suggested to be more at risk of psychological distress due to the negative impact of disease symptoms on normative functioning (Drossman, 1989; Levenstein 2002; Porcelli, *et al.,* 1996). The findings from this study, however, were based on a sample of participants who overall, subjectively rated themselves as doing well physically. Although disease severity was not formally assessed, it could tentatively be argued that this sample was on average, not experiencing significant disease activity, based on these ratings. A recent, well controlled study in the adult population suggested that psychological functioning was a significant predictive factor for HRQOL outcomes even when disease severity was controlled for (Guthrie *et al.*, 2002) which the findings of this study would support.

One of the possible reasons for the significant predictive influence of psychological functioning in this study could be the context of adolescence itself. It has been suggested that a diagnosis of IBD may have an adverse effect on the successful attainment of important developmental outcomes in adolescence such as autonomy and peer acceptance and lead to poor outcomes on HRQOL (Loonen *et al.,* 2002). Difficulties attaining such outcomes have been recognised as leading to significant emotional and behavioural problems in adolescents, particularly for those with chronic health conditions (Holmbeck, 2002). Current literature relating to other chronic illness populations such as cystic fibrosis, epilepsy, asthma, arthritis and diabetes in adolescence have all made links between HRQOL and developmental

concerns of adolescence such as peer acceptance, self identity and autonomy (Arrington-Sanders *et al.,* 2006; Gee *et al.*, 2003; Jorngarden *et al.*, 2006; Petersen *et al.*, 2006; Raty *et al.*, 2003). The findings in this study would suggest that adolescents in this sample experience similar emotional difficulties to those with other chronic medical conditions.

These findings do not support previous research which has suggested that parental mental heath is predictive of the HRQOL of children with IBD (Greenley & Cunningham, 2009), though a significant relationship between parental psychological well-being and adolescent HRQOL was found, suggesting this remains an important consideration. Parental distress has also been linked to disease exacerbation in the paediatric IBD population which further highlights the importance of considering parental psychological well-being (Greenley & Cunningham, 2009; Tojek *et al.*, 2002; Wood *et al.,* 1989). In this study, disease severity was not controlled for, however, as discussed in the previous section, subjective ratings of physical well-being suggest that the majority of participants were not experiencing active disease.

There are several proposed reasons as to why parents of young people with IBD may be at an increased risk of psychological dysfunction. These include the stress of dealing with the intermittent and unpredictable course of IBD itself and ensuring treatment interventions are adhered to. Furthermore, parents have the additional responsibility of helping their children cope with the negative symptoms of the disease and the negative side effects of some treatment interventions e.g. weight gain and acne from corticosteroids and post-surgical stoma care (Burke *et al.*, 1994; Greenley & Cunningham, 2009; Cunningham & Banez, 2006). Parents of young people with IBD also likely to experience general concerns and stressors that are common in parents with other chronic medical conditions. These include, worry about the future health of their child, attending multiple medical appointments and managing to balance other commitments such as work and other family members (Quittner *et al.*, 2003). The results in this study indicate that, in line with previous

findings, the mental well-being of parents of those with IBD is significantly associated with HRQOL outcomes in children.

As discussed previously, increasing autonomy is an important developmental task within the context of adolescence (Holmbeck, 2002). Chronic medical conditions in childhood have been found to have a negative influence on the development of autonomy and parental overprotection is common (Parker & Lipscombe, 1979; Thomasgard & Metz, 1993). The majority of studies have however been undertaken within conditions which are life threatening or life limiting, and consequently less is known about how successfully adolescents with IBD achieve autonomy. A previous study highlighted that having a diagnosis of IBD in adolescence may negatively influence the successful attainment of autonomy (Loonen *et al,* 2002; Otley *et al.*, 2006). Although this study did not find a relationship between parental over-protection and HRQOL, further research using larger sample sizes and perhaps using alternative research methods such as qualitative interview based studies may provide a more in-depth analysis of the relationship between autonomy, over-protection and health related quality of life, in this population.

With regard to gender differences, the results indicate that gender did not significantly contribute to the variance in HRQOL outcomes in the adolescent population. Further examination of gender differences using independent *t*- test analysis, however, indicated that females reported significantly lower HRQOL total scores than males across the sample. Females, on average, reported lower scores than males across all domains, however this difference was found to be statistically significant on physical, social and psycho-social domains. Females reported slightly lower scores on emotional and school domains, although these differences were not statistically significant. Moderate effect sizes were found on psycho-social domains and large effect sizes were found on physical, social and total HRQOL scores.

These findings differ from the one study in the paediatric literature which has specifically examined gender differences in adolescent IBD (De Boer *et al.*, 2005). The findings here, however, are in line with previous research in the adult IBD

population which reported that females report poorer HRQOL than males (Casellas *et al.*, 2002; Larrson *et al.,* 2008). The results also support previous studies in other paediatric chronic illness populations which have found that females typically report lower HRQOL than their male counterparts (Arrington-Sanders, *et al.*, 2006; Austin *et al.,*1996; Benavente-Aguilar *et al.,* 2004; Devinsky *et al.,* 1990; Gee *et al.*, 2003; Naughton *et al.*, 2008; Petersen *et* al., 2006; Raty *et al.*, 2003). Across different HRQOL measures, and in different chronic illness populations, females have commonly been found to report lower HRQOL across physical domains, which the findings here support (Arrington-Sanders *et al.*, 2006; Naughton *et al.*, 2008; Petersen *et al.*, 2006).

The reasons why females report lower HRQOL scores than males has been linked to developmental considerations in adolescence. Gender has been recognised as having a moderating role in physical and mental health outcomes for adolescents (Williams *et al.*, 2002). As discussed previously, gender differences in adolescent psychological functioning have been linked to reduced body image, body dissatisfaction, increased self-focus and differences in pubertal onset (De Rooy *et al.*, 2001; Okoro & Kane, 2009; Reddy & Wolf, 2001; Seeley *et al.,* 2009; Van Pelt *et al.,* 2006). It has also been suggested that females may focus more on physical ideals than males in what has been referred to as increased self-objectivity (Grabe *et al.*, 2007). Having a chronic medical condition which impacts upon physical appearance may therefore be a risk factor for the development of emotional and behavioural difficulties. Given the impact of IBD and its treatment on physical appearance, such as growth deficiencies, delayed puberty, cushingoid features and acne, it is possible that self-objectivity in female adolescents may be linked to poorer HRQOL outcomes, although this, to date, has not been examined. Further research is required to increase understanding of why gender differences exist in HRQOL outcomes in this population.

Hypothesis 3: Parent versus self report agreement on HRQOL outcomes will be better on physical domains than on emotional domains in adolescents with gastrointestinal disorders.

In comparisons of parent versus self report on the PedsQL, agreement was found to be moderate to good across all domains. Agreement was slightly higher on physical domains than on emotional domains, which is in line with previous research in this area which has suggested that agreement between parent and self report is better on physical functioning than emotional functioning (Brunner *et al.*, 2004; Modi & Quittner, 2002; Quittner *et al.*, 2003; Theunissen *et al.*, 1998).

The results also indicated that parents, on average, consistently underestimated their child's HRQOL, across all domains. In other words, the adolescents in this study, typically rated their HRQOL as better than their parents. This is in line with a previous study into the HRQOL of young people with cerebral palsy (White-Koning, 2008) whereby parents typically reported their child's HRQOL to be lower than their children did. Other studies have suggested that parents will often over-estimate their child's HRQOL in physical areas of functioning and under-estimate their child's functioning in emotional and social areas (Waters *et al.*, 2003). This was not found to be the case in this study. Results indicated that parents were typically good raters of their child's HRQOL which is contrary to a significant proportion of the current evidence base (Achenbach *et al,* 1987; Brunner *et al.*, 2004; Garber *et al.*, 1998; Loonen *et al.,* 2002; Varni *et al.*, 1998; Waters, *et al.*, 2003; White-Koning *et al.,* 2006).

There are a number of possible reasons as to why agreement was better in this study than previous research. In order to maximise return rates, questionnaires were given to adolescents and their parents simultaneously, prior to their gastroenterology clinic appointment. As such, the teenager and parent were therefore typically in close proximity to one another when completing the questionnaires. Whilst the instructions for completing the questionnaires reminded participants not to compare answers, there was no way of controlling for this, within the clinic environment. It could therefore be postulated that parents and adolescents may have been more likely

to compare or discuss responses. This may have led to better agreement. If this was the case, this would be an interesting point. The majority of studies in this area has concentrated on separate assessments of HRQOL being completed by parent and child, however, allowing both parent and child to complete their assessments together may allow parents to gain better insight and understanding into how their child perceives their functioning to be.

Another possible reason for better agreement may be related to the holistic focus of the medical team involved in this research study. The paediatric gastroenterology team has strong links with the attached paediatric psychology service and consequently staff are well informed about the psychological issues pertinent to children and young people with IBD and their parents. Discussions regarding well-being and overall functioning at home and at school are common-place and may facilitate increased communication between parents and their children on these issues.

4.3 Limitations

This study has several limitations which should be considered which suggest that the above results should be interpreted tentatively. These limitations are related to sample size and the implications on the statistical power of the findings, methodological limitations related specifically to this study and more general methodological limitations related to cross-sectional research.

4.3.1 Sample size

All attempts were made to recruit a large enough sample size to achieve an acceptable level of statistical power in order to complete regression analysis. The sample size achieved fell below even conservative estimates as to what is appropriate to conduct regression analysis in order to achieve adequate statistical power (Miles & Shevlin, 2001). The results should be interpreted with caution as the conclusions that can be drawn from the findings are limited, due to being underpowered. Future research should endeavour to employ larger sample sizes to ensure that statistical power is sufficient.

4.3.2 Selection bias

It could be argued that the exclusion criteria outlined in this study may have led to some level of selection bias. Excluding prospective participants who were deemed too ill to participate could have inadvertently led to positively skewed results. This is reflected in the high mean scores on how well each participant was doing in relation to symptoms (wellness scores) and on the overall positive results across all measures (please refer to Tables 2-4). This would suggest that the results found in this study may not be applicable to adolescents who had more active disease. Previous research in the adult population has examined differences in HRQOL between those who were experiencing exacerbation of symptoms and those who were not and found that disease activity had a significant negative impact on HRQOL (Larsson *et al.*, 2008). Future research into factors which predict HRQOL outcomes in paediatric IBD should consider the importance of including those experiencing disease exacerbation.

4.3.3 Disease severity

As noted above, previous studies have suggested that disease severity is the most significant predictive factor in HRQOL outcomes for patients with IBD. Despite this, this study did not undertake standardised clinical assessment of disease severity and relied upon subjective ratings of physical well-being rating using visual analogue scale. It could be postulated that lack of information on actual disease severity limits the generalisability of the findings in this study as it could be argued that the sample was not representative of those suffering from active disease and the possible contribution of disease activity could not be controlled for in the regression analysis.

There were several reasons for not including standardised measures of disease activity. Firstly, the time constraints of the research meant that it was only possible for the researcher to attend one clinic a week and it was decided that this should be the busiest clinic to maximise return rates. Unfortunately, this also meant that asking the medical staff to complete standardised measures of disease severity for participants with IBD would have significantly impacted upon the clinic time and on patients' waiting times. This was therefore not considered feasible within the

constraints of this study or considered appropriate in terms of current NHS policy on clinic waiting times. It may have been useful to ask the medical team to submit a similar visual analogue scale based upon the clinic appointment however the validity of this may have been problematic. There were a number of different medical consultants and other members of the medical team who saw patients in this clinic which would have affected the reliability and validity of any clinician ratings, either visual analogue or otherwise and necessitated the need for inter-rater reliability testing to be conducted which would not have been feasible within the time constraints of the data-collection period. It may have been useful, however, to attain parental proxy reports of physical well-being/disease severity as an additional source of information related to well-being/disease severity. Future studies should endeavour to collate information on disease severity from a range of sources to control for the impact of this on HRQOL.

4.3.4 Use of the Beck Depression Inventory

The Beck Depression Inventory (BDI) was administered to both the adolescent and parent participants and although validated for use with those over the age of 13 years the use of the BDI did have its limitations. The BDI includes a question related to loss of interest in sex (Appendix 2 – item 21). During the data collection, several parents and adolescents discussed the appropriateness of this item, particularly for those at the lower end of the age-range. It perhaps would have been advisable to have considered utilising an alternative measure of adolescent depression which would have been more appropriate to the age-range being assessed. Furthermore, the BDI does not relate specifically to developmental areas of difficulty such as peer relationships and school, difficulties with which have been linked to emotional and behavioural problems in adolescence (e.g. Holmbeck, 2002). Future studies should endeavour to use measurement tools which are both theoretically valid and developmentally appropriate for the adolescent population.

4.3.5 Cross-sectional design

Given that this study employed a cross-sectional design, it is important to highlight the limitations associated with this particular type of research design. This study

involved the collation of data at a single time point and whilst this has the advantage of being cost and time effective, it also has the disadvantage of allowing only for retrospective analysis. The measurement of health-related quality of life was therefore only valid for the time point in which the measure was completed, based on the individual's retrospective analysis of their functioning. Furthermore, cross-sectional designs allow only for inferences to be made regarding associations between variables and do not allow for the direction of causality to be determined. In this study, it can be inferred that depression, anxiety and self esteem are associated with and may statistically predict HRQOL outcomes, but no assumptions can be made as to the causal direction of the findings (Bernard, 2000; Bowling, 1997; Gomm, 2000).

4.3.6 Self-administered questionnaires

The questionnaires completed in this study were self administered, which has several advantages and disadvantages. One of the advantages of self-administered questionnaires is that they reduce the risk of interviewer bias and rely purely on self report. In addition, the use of questionnaires is inexpensive and time efficient, with the ability to measure a large group in a relatively short time frame (Blank & Switzer, 2006). The disadvantages of this method include the reliance on the honesty of the participant. The researcher has no control over the way in which questions are interpreted and responded to and may be more prone to giving what they perceive as 'desired' responses, which can reduce validity (Blank & Switzer, 2006). Self-administered questionnaires also run the risk of participants missing questions or leaving responses blank, or adding additional information which cannot be interpreted statistically. Whilst every attempt was made to ensure that measures were completed correctly prior to individuals leaving clinic, there continued to be difficulties with missing data or incomplete questionnaires.

4.3.7 Postal return

The postal return option also raises some limitations. The advantages of this method were that it allowed participants the flexibility of reducing the amount of time spent in the outpatients department, thus having consideration for those individuals who

were returning to work or for adolescents returning to school. One of the advantages of having questionnaires completed in clinic was the ability to control for comparative questionnaires being completed at the same time point an important consideration in cross-sectional and comparative analysis. Providing participants with the option of returning measures by post reduced the extent to which this could be controlled for. Secondly, HRQOL questionnaires completed in clinic by parents and adolescents could be reliably compared with parents for comparison in terms of assessment of the same point in time a key element of cross-sectional analysis. The postal return option limited the extent to which this could be controlled for, i.e. adolescents could have completed questionnaires at a different time to their parents, which may have led to worse agreement. Fortunately the results in this study were indicative of high agreement between raters, but this remains a consideration for further research into cross-informant variance.

4.3.8 Additional limitations

It would have been useful to have considered the impact of pubertal status on HRQOL outcomes in this study. As discussed, timing of puberty has been recognised as a risk factor for emotional and behavioural difficulties, particularly in females whereas early pubertal onset in males has been linked to better developmental outcomes (Seeley *et al.,* 2009). Information on whether participants had reached puberty was not collated and the ability to control for delayed pubertal onset in adolescents with IBD would have been valuable, given the established link with psychological functioning, particularly in females.

Time since diagnosis has also been highlighted as an important factor in HRQOL outcomes (Blanchard & Hyams, 2006; Otley *et al.*, 2006), yet this was not controlled for in this study. Otley and colleagues (2006) found that HRQOL improved after one year post diagnosis. This, however, was not controlled for in this study. It could be argued that time since diagnosis may have contributed to a significant proportion of the variance in findings.

In this study, the sample consisted of more males than females. It could be argued that this may have skewed results found in comparisons between males and females. Previous studies examining gender differences in HRQOL outcomes in the general adolescent population however have indicated that even when females account for a higher proportion of the sample, HRQOL scores remain significantly lower than males (Jorngarden *et al.*, 2006).

4.4 Clinical implications

Although this study has several limitations, the results have several clinical implications that are worthy of consideration. Psychological dysfunction in adolescents with IBD is likely to have a significant negative impact on disease course and use of service provision. Early identification of poor psychological well-being should be of key importance to health care providers. Studies into the efficacy of psychological interventions for adolescents with IBD have given promising results and have indicated that such interventions may be beneficial in terms of managing symptoms and improving overall quality of life (Szigethy, *et al.*, 2007).

Although HRQOL measures have been highlighted as a useful means of assessing functioning, responses to treatment and communication between clinicians and patients, they are not routinely used in practice (Higginson & Carr, 2001). This study has highlighted that the use of HRQOL provides important information for patients, their parents and health care providers and should be used more routinely to facilitate in particular, the early identification of emotional and behavioural difficulties in children and young people with IBD.

Adolescent health concerns and the link between HRQOL has also been highlighted and has important clinical implications. More specialist support should be provided for children with chronic illnesses who are entering adolescence. Parents should be supported in helping facilitate autonomy for their children. Adolescents should also be supported in improving self-identity, body image and peer interactions in order to improve the negotiation through this complex life stage. Special consideration should be given to adolescent females who have been identified as at a greater risk of

lower HRQOL than their male counterparts. In particular, females appear to have a particularly difficult time coping with the physical aspects of their illness and more support needs to be provided for this.

The mental well-being of parents is another important consideration for health care providers, given the reported influence on HRQOL and disease activity. More information on sources of support should be provided for parents at diagnosis and clinicians should remain aware that parents may require additional support to cope with the demands of caring for a child with IBD. Providing psychological and social support for parents of children with chronic medical conditions has been found to be effective in reducing feelings of anxiety, distress and increasing adjustment and coping (Chernoff *et al.*, 2002; Sahler *et al.,* 2005; Streisand *et al.,* 2000).

4.5 Future research

This study has made several indications in relation to further research in this area. More studies are needed to investigate the HRQOL of adolescents with gastrointestinal disorders in the British population. These studies need to employ large sample sizes and utilise standardised, reliable methods of measurement.

Further investigations into factors which predict HRQOL will also help to develop treatment and support options for adolescents and should focus on coping strategies and areas of support. Other pertinent areas within adolescence which are likely to be highly relevant in the IBD population include the impact of gender and reasons for gender differences including examination of the mediating role of increased self focus, self-objectivity, body image and pubertal status on overall HRQOL.

Although this study highlighted factors which may predict HRQOL outcomes for adolescents with IBD, there was no information on the causal direction of these factors. Long term longitudinal studies of children and adolescents with IBD and their parents would be useful to examine these issues further.

Finally, successful attainment of developmental outcome such as autonomy and peer acceptance are worthy of further consideration in relation to IBD. A diagnosis of IBD may have an adverse affect on the successful attainment of developmental outcomes in adolescence such as autonomy and peer acceptance. Further studies to increase our understanding of the impact of chronic conditions on peer acceptance, involving adolescents with IBD and their peers, would be beneficial. Intervention studies to investigate whether peer education programmes or school-based interventions are beneficial in improving peer acceptance may also be useful. Further research into parental and adolescent perceptions of autonomy and which factors contribute to the increased prevalence of parental over-protection may also be worthwhile.

4.6 Conclusions

This study highlighted that psychological functioning in adolescents with IBD and their parents has an influence on HRQOL outcomes. The psychological well-being of adolescents with IBD and their parents should therefore be an important consideration for health care providers and researchers alike. Furthermore, females with IBD were found to report lower HRQOL than males suggesting the need for increased awareness of gender differences in the IBD population. Parents of children with IBD may be better at understanding their child's difficulties than in other illness population and increased awareness of factors which contribute to better understanding, such as holistic approaches to care, should be considered.

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Appendix 1:

- Participant information leaflets
- Invitation letters
- Consent forms
- Instructions for participants

What if I say yes and then change my mind?

You can withdraw from the study at any time, without giving a reason and this will not affect your future treatment.

What about confidentiality?

Your responses will be kept confidential although we do ask you to put your name on the consent form so that we know you have agreed to take part.

We will only pass this information on if any of the responses on the questionnaires indicate that you may be in danger of hurting yourself or someone else.

If any of your responses suggest that you may need additional support you and your parent will be contacted to discuss whether or not you would like to be referred to a specialist service for further help.

What if I want to talk to someone about my answers?

The researcher will be available to discuss any concerns you have or to give you information on other services which can help with any difficulties you may be having.

Alternatively the following websites have information you may find useful:
www.stressandanxietyinteenagers.co.uk
www.depressioninteenagers.co.uk

What if I have any more questions?

The researcher will be available throughout the clinic to answer any questions you may have.

If you have any further questions about any part of this study please contact the main researcher:

Fionnuala Scullion,
Clinical Psychologist in training
Tel: (0131) 536 0535
Email: fscullion@nhs.net

Alternatively, you can contact the Lothian Research & Development Office for further information:
(0131) **0131 242 3330**

This information is also available on request in other formats by phoning
(0131) 336 0535

Produced by: Fionnuala Scullion*
Publication date: April 2008

*In conjunction with the Paediatric Psychology & Liaison Service and the Department of Gastroenterology & Nutrition at the Royal Hospital for Sick Children, Edinburgh.

NHS
Lothian

Quality of Life in Adolescents with Inflammatory Bowel Disease and/or Irritable Bowel Syndrome

Information Leaflet for Teenagers

What would I have to do?

This research is based only on filling in questionnaires which should take between 20-30 minutes to complete.

What is the study about?

The Gastroenterology Department at the Royal Hospital for Sick Children and the Doctoral Training Course in Clinical Psychology at Edinburgh University are interested in how having Inflammatory Bowel Disease (IBD) and/or Irritable Bowel Syndrome (IBS) affects mood, worries and overall well-being.

We are also interested in how parents and teenagers agree on how well the person with IBD or IBS is doing. Very often it's parents who feel their son or daughter needs help so we are interested in how closely parents and teenagers answers are matched.

What do the questionnaires ask about?

There will be a brief questionnaire asking for general information such as gender, age, diagnosis, how well you are and details of any medication you are currently taking.

The other questionnaires will be looking at your mood, any worries you may have, how you get on with your mum or dad and how you think about yourself.

There will also be a questionnaire looking at health related quality of life.

What is Health Related Quality of Life?

Health Related Quality of Life means how overall an illness affects someone's physical ability, how they get along with friends & family and how they feel (i.e. their mood).

Who are we asking to take part?

Young people aged 13-18 who have a diagnosis of IBD and/or IBS and their parents are being invited to take part in this study.

We would like you to read this leaflet carefully and decide whether you would like to be involved.

When will the research happen?

You will be approached by the researcher at your next Gastroenterology clinic appointment. The researcher will ask you to complete and sign a consent form which confirms that you have read, understood and agree with what you are being asked to do in this study.

If you agree to be involved in this research you will then be given 5 questionnaires to complete.

These can be completed whilst waiting to see the doctor or after your clinic appointment

If you feel you would like more time to complete the questionnaires, you can be provided with an envelope to return the questionnaires by post.

What happens if I don't want to take part?

All you have to do is sign the consent form telling us you do not wish to take part. You do not have to give an explanation why and this will not in any way affect your future treatment.

It is estimated that the questionnaires will take between 20-30 minutes to complete.

Confidentiality

Your responses will be entirely anonymous although we do ask you to put your name on the consent form so that we know you have agreed to take part. Your answers will be kept separate from the consent form and given a special code.

This code will only be used to identify you or your child if any of the responses indicate risk of harm to self or others in which case you or your child may be asked to undergo further assessment.

If any of the responses indicate that you or your child may benefit from additional support, you will be contacted to discuss possible referral to specialist services such as the Paediatric Psychology & Liaison Service (PPALS) or Adult Mental Health Services (AMH).

If you have any further questions regarding any aspect of this research project, please do not hesitate to contact the main researcher:

Fionnuala Scullion, Clinical Psychologist in training
Tel: 0131 536 0535
Email: fscullion@nhs.net

Alternatively, you can contact the Research and Development team for further, independent advice:

Research and Development Office (NHS Lothian)
Queen's Medical Research Institute
47 Little France Crescent
Edinburgh EH16 4TJ
Tel: 0131 242 3330

A summary of the main findings will be made available from August 2009, copies of which can be obtained by contacting the main researcher via email

NHS Lothian

Quality of Life in Adolescents with Inflammatory Bowel Disease and/or Irritable Bowel Syndrome

Information Leaflet for Parents

Version 3: 23/07/2008

Background to Research

The Gastroenterology Department at the Royal Hospital for Sick Children in conjunction with the Doctoral Training Course in Clinical Psychology at Edinburgh University are investigating how a diagnosis of Inflammatory Bowel Disease (IBD) and/or Irritable Bowel Syndrome (IBS) affects the health related quality of life of adolescents.

Health Related Quality of Life

Health related quality of life is how everyday life and daily functioning (e.g. physically, socially and at school) are affected by a medical condition.

Psychological Functioning

We are also interested in trying to establish whether factors such as self esteem, mood, perceived autonomy (i.e. how independent of their parents they feel) and general worry affect the quality of life of adolescents with IBD or IBS.

We are also interested in examining if there is a link between how parents are feeling and their child's quality of life. It is hoped that this information can then be used to develop new treatment and/or support options for both adolescents with IBD or IBS and their parents.

Parent/Child Agreement

We are also interested in looking at how parents and teenagers agree on how well the person with IBD/IBS is doing. Very often it is the parent who feels their son or daughter needs help, so we are interested in how closely answers between teenagers and their parents are matched

Participants

All adolescents with a diagnosis of IBD and the same number with a diagnosis of IBS have been identified via the Gastroenterology caseload at RHSC.

You are asked to read this information sheet carefully to consider whether you would like to be involved in this research.

You will be approached at your next clinic appointment and asked whether or not you would like to take part. If you agree to take part you will be asked to sign a consent form indicating in writing that you fully agree to participate.

PARTICIPATION IS ENTIRELY VOLUNTARY AND YOU MAY DECLINE FROM TAKING PART AT ANT TIME, WITHOUT EXPLANATION AND THIS WILL NOT, IN ANY WAY, AFFECT YOUR CHILD'S FUTURE CARE

If you consent to be involved you will then be given a number of questionnaires to complete whilst waiting to see the doctor or after the clinic appointment. If you feel you would like more time arrangements can be made to return questionnaires by post. The researcher will be on hand throughout the clinic to answer any questions you may have and to collect the completed questionnaires.

Questionnaires

There will be a brief questionnaire asking for general information such as gender, age, diagnosis, severity of symptoms and any medication the adolescent is currently taking.

You will also be given a questionnaire relating to your child's current health related quality of life. Parenting a child with a chronic condition can be upsetting and anxiety provoking so we have also included two questionnaires which look at your own mood and anxiety levels.

Paediatric Psychology & Liaison Service
RHSC
3 Rillbank Terrace
Edinburgh
Tel: (0131)536 0535
Email: fscullion@nhs.net

Ref: FS/Research/

Dear

My name is Fionnuala Scullion and I am a fifth year Clinical Psychologist in post graduate training currently on placement at the Royal Hospital for Sick Children, Edinburgh. As part of my training I am undertaking a research project investigating how having Inflammatory Bowel Disease and/or Irritable Bowel Syndrome (including Recurrent Abdominal Pain) affects the lives of young people and their parents. I would like to invite you both to participate in this research which involves the completion of questionnaires.

You will find information leaflets enclosed which outline where and when this research will take place and which describe the research in more detail.

I would be grateful if you would read the information leaflets carefully and decide whether or not you would both like to be involved.

If you have any questions or concerns regarding any aspect of this research, please do not hesitate to contact me at the above address.

Many thanks for your consideration

Yours sincerely

Fionnuala Scullion
Clinical Psychologist in training
RHSC

Dr David Wilson
Senior Lecturer in
Paediatric Gastroenterology & Nutrition
RHSC

NHS
Lothian

CONSENT FORM

PART 1 – TO BE COMPLETED BY ADOLESCENT

PLEASE TICK

1. I confirm that I have read and understood the information leaflet for the above study and that I have had the opportunity to ask questions ☐

2. I understand that my taking part is voluntary and that I am free to withdraw at any time, without giving a reason and without my medical care or legal rights being affected ☐

3. I **agree** to take part in the above study ☐

   I **do not agree** to take part in the above study ☐

SIGNED..... Date:.....

NAME IN BLOCK CAPITALS.....

THIS FORM WILL NOT BE KEPT WITH ANY ANSWERS THAT YOU GIVE

NHS
Lothian

CONSENT FORM

PART 2 – TO BE COMPLETED BY <u>PARENT/GUARDIAN</u>

1. I confirm that I have read and understood the information leaflet for the above study and that I have had the opportunity to ask questions ☐

2. I understand that my taking part is voluntary and that I am free to withdraw at any time, without giving a reason and without my or my son/daughter's medical care or legal rights being affected ☐

3. I **agree** to take part in the above study ☐

   I **do not agree** to take part in the above study ☐

SIGNED..... Date:.....

NAME IN BLOCK CAPITALS.....

THIS FORM WILL NOT BE KEPT WITH ANY ANSWERS THAT YOU GIVE

ADVICE TO PARTICIPANTS COMPLETING QUESTIONNAIRES

- Please do not put your name on any of the questionnaires to ensure confidentiality

- As this is a comparative study we would be grateful if you do not compare answers with the young person/parent or check over the young person's/parent's responses

- Parental measures include questionnaires related to the child's health related quality of life and measures of the parent's own mood & anxiety – please refer to information leaflet for more details

- If you would like more time to complete the questionnaires, prepaid envelopes are available from the researcher to return the questionnaires by post

- When you have both completed the questionnaires please return to the researcher before leaving the clinic

MANY THANKS FOR TAKING THE TIME TO COMPLETE THESE QUESTIONNAIRES YOUR PARTICIPATION IS VERY MUCH APPRECIATED!

Appendix 2:

- Demographic Information Form
- Pediatiric Quality of Life Inventory (Parent and Teenager Report)
- Parental Bonding Instrument
- Spence Anxiety Scale for Children
- Rosenberg Self Esteem Scale
- Beck Anxiety Inventory

PARTICIPANT INFORMATION

1. GENDER (please tick)

Male ☐

Female ☐

2. AGE **.....years**

3. PRIMARY MEDICAL DIAGNOSIS (please tick one box only)

Ulcerative Colitis ☐ **Indeterminate Colitis** ☐

Irritable Bowel Syndrome ☐ **Recurrent Abdominal Pain** ☐

Crohn's Disease ☐ **Other (please specify).....**

4. CURRENT MEDICATION (if any)

_____
_____
_____
_____
_____
_____
_____

5. Current severity of symptoms

Please mark an "X" at the point on the line that best describes how well you have been feeling **over the past week**. While there may have been some changes during that time, please try to give one rating.

0 _____ 100

I have felt very unwell

I have felt very well

ID# _____

Date: _____

PedsQL™

Pediatric Quality of Life Inventory (UK)

Version 4.0

TEENAGERS REPORT (ages 13-18)

DIRECTIONS

On the following page is a list of things that might be a problem for you. Please tell us **how much of a problem** each one has been for you during the **past ONE month** by circling:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers.
If you do not understand a question, please ask for help.

CODE: __ / ___

*In the past **ONE month**, how much of a **problem** has this been for you ...*

ABOUT MY HEALTH AND ACTIVITIES *(problems with...)*	Never	Almost Never	Some-times	Often	Almost Always
1. It is hard for me to walk down the road a little bit	0	1	2	3	4
2. It is hard for me to run	0	1	2	3	4
3. It is hard for me to do sports or running games	0	1	2	3	4
4. It is hard for me to lift heavy things	0	1	2	3	4
5. It is hard for me to have a bath or shower by myself	0	1	2	3	4
6. It is hard for me to tidy up around the house	0	1	2	3	4
7. I hurt or ache	0	1	2	3	4
8. I feel very tired	0	1	2	3	4

ABOUT MY FEELINGS *(problems with...)*	Never	Almost Never	Some-times	Often	Almost Always
1. I feel afraid or scared	0	1	2	3	4
2. I feel sad or unhappy	0	1	2	3	4
3. I feel angry or cross	0	1	2	3	4
4. I have trouble sleeping at night	0	1	2	3	4
5. I worry about what will happen to me	0	1	2	3	4

HOW I GET ALONG WITH OTHERS *(problems with...)*	Never	Almost Never	Some-times	Often	Almost Always
1. I have trouble getting on with other teenagers	0	1	2	3	4
2. Other teenagers do not want to be my friend	0	1	2	3	4
3. Other teenagers bully me	0	1	2	3	4
4. I am not able to do things that other teenagers my age can do	0	1	2	3	4
5. It is hard to keep up with my peers during activities	0	1	2	3	4

ABOUT SCHOOL *(problems with...)*	Never	Almost Never	Some-times	Often	Almost Always
1. It is hard to pay attention in class	0	1	2	3	4
2. I forget things	0	1	2	3	4
3. I have trouble keeping up with my schoolwork	0	1	2	3	4
4. I have days off school because of not feeling well	0	1	2	3	4
5. I have days off school to go to the doctor or hospital	0	1	2	3	4

ID#_____

Date:_____

PedsQL™

Pediatric Quality of Life Inventory (UK)

Version 4.0

PARENT REPORT for TEENAGERS (ages 13-18)

DIRECTIONS

On the following page is a list of things that might be a problem for **your teenager.** Please tell us **how much of a problem** each one has been for **your teenager** during the **past ONE month** by circling:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers.
If you do not understand a question, please ask for help.

CODE: __ /____

*In the past **ONE month,** how much of a **problem** has your teenager had with ...*

PHYSICAL FUNCTIONING *(problems with...)*	Never	Almost Never	Some-times	Often	Almost Always
1. Walking down the road a little bit	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in sports or running games	0	1	2	3	4
4. Lifting heavy things	0	1	2	3	4
5. Having a bath or shower by him or herself	0	1	2	3	4
6. Tidying up around the house	0	1	2	3	4
7. Having hurts or aches.	0	1	2	3	4
8. Feeling very tired	0	1	2	3	4

EMOTIONAL FUNCTIONING *(problems with...)*	Never	Almost Never	Some-times	Often	Almost Always
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or unhappy	0	1	2	3	4
3. Feeling angry or cross	0	1	2	3	4
4. Trouble sleeping at night	0	1	2	3	4
5. Worrying about what will happen to him or her	0	1	2	3	4

SOCIAL FUNCTIONING *(problems with...)*	Never	Almost Never	Some-times	Often	Almost Always
1. Getting on with other teenagers	0	1	2	3	4
2. Other teenagers not wanting to be his or her friend	0	1	2	3	4
3. Getting bullied by other teenagers	0	1	2	3	4
4. Not able to do things that other teenagers his or her age can do	0	1	2	3	4
5. Keeping up with other teenagers during activities	0	1	2	3	4

SCHOOL FUNCTIONING *(problems with...)*	Never	Almost Never	Some-times	Often	Almost Always
1. Paying attention in class	0	1	2	3	4
2. Forgetting things	0	1	2	3	4
3. Keeping up with schoolwork	0	1	2	3	4
4. Having days off school because of not feeling well	0	1	2	3	4
5. Having days off school to go to the doctor or hospital	0	1	2	3	4

http://www.blackdoginstitute.org.au/

MOTHER FORM

This questionnaire lists various attitudes and behaviours of parents. As you remember your MOTHER in your first 16 years would you place a tick in the most appropriate box next to each question.

	Very like	Moderately like	Moderately unlike	Very unlike
1. Spoke to me in a warm and friendly voice	☐	☐	☐	☐
2. Did not help me as much as I needed	☐	☐	☐	☐
3. Let me do those things I liked doing	☐	☐	☐	☐
4. Seemed emotionally cold to me	☐	☐	☐	☐
5. Appeared to understand my problems and worries	☐	☐	☐	☐
6. Was affectionate to me	☐	☐	☐	☐
7. Liked me to make my own decisions	☐	☐	☐	☐
8. Did not want me to grow up	☐	☐	☐	☐
9. Tried to control everything I did	☐	☐	☐	☐
10. Invaded my privacy	☐	☐	☐	☐
11. Enjoyed talking things over with me	☐	☐	☐	☐
12. Frequently smiled at me	☐	☐	☐	☐
13. Tended to baby me	☐	☐	☐	☐
14. Did not seem to understand what I needed or wanted	☐	☐	☐	☐
15. Let me decide things for myself	☐	☐	☐	☐
16. Made me feel I wasn't wanted	☐	☐	☐	☐
17. Could make me feel better when I was upset	☐	☐	☐	☐
18. Did not talk with me very much	☐	☐	☐	☐
19. Tried to make me feel dependent on her/him	☐	☐	☐	☐
20. Felt I could not look after myself unless she/he was around	☐	☐	☐	☐
21. Gave me as much freedom as I wanted	☐	☐	☐	☐
22. Let me go out as often as I wanted	☐	☐	☐	☐
23. Was overprotective of me	☐	☐	☐	☐
24. Did not praise me	☐	☐	☐	☐
25. Let me dress in any way I pleased	☐	☐	☐	☐

CODE : __ / __

http://www.blackdoginstitute.org.au/

FATHER FORM

This questionnaire lists various attitudes and behaviours of parents. As you remember your FATHER in your first 16 years would you place a tick in the most appropriate box next to each question.

	Very like	Moderately like	Moderately unlike	Very unlike
1. Spoke to me in a warm and friendly voice	☐	☐	☐	☐
2. Did not help me as much as I needed	☐	☐	☐	☐
3. Let me do those things I liked doing	☐	☐	☐	☐
4. Seemed emotionally cold to me	☐	☐	☐	☐
5. Appeared to understand my problems and worries	☐	☐	☐	☐
6. Was affectionate to me	☐	☐	☐	☐
7. Liked me to make my own decisions	☐	☐	☐	☐
8. Did not want me to grow up	☐	☐	☐	☐
9. Tried to control everything I did	☐	☐	☐	☐
10. Invaded my privacy	☐	☐	☐	☐
11. Enjoyed talking things over with me	☐	☐	☐	☐
12. Frequently smiled at me	☐	☐	☐	☐
13. Tended to baby me	☐	☐	☐	☐
14. Did not seem to understand what I needed or wanted	☐	☐	☐	☐
15. Let me decide things for myself	☐	☐	☐	☐
16. Made me feel I wasn't wanted	☐	☐	☐	☐
17. Could make me feel better when I was upset	☐	☐	☐	☐
18. Did not talk with me very much	☐	☐	☐	☐
19. Tried to make me feel dependent of her/him	☐	☐	☐	☐
20. Felt I could not look after myself unless she/he was around	☐	☐	☐	☐
21. Gave me as much freedom as I wanted	☐	☐	☐	☐
22. Let me go out as often as I wanted	☐	☐	☐	☐
23. Was overprotective of me	☐	☐	☐	☐
24.Did not praise me	☐	☐	☐	☐
25. Let me dress in any way I pleased	☐	☐	☐	☐

CODE: __/___

SPENCE CHILDREN'S ANXIETY SCALE

[redacted] [redacted] Date: _____

PLEASE PUT A CIRCLE AROUND THE WORD THAT SHOWS HOW OFTEN EACH OF THESE THINGS HAPPEN TO YOU. THERE ARE NO RIGHT OR WRONG ANSWERS.

1.	I worry about things	Never	Sometimes	Often	Always
2.	I am scared of the dark	Never	Sometimes	Often	Always
3.	When I have a problem, I get a funny feeling in my stomach	Never	Sometimes	Often	Always
4.	I feel afraid	Never	Sometimes	Often	Always
5.	I would feel afraid of being on my own at home	Never	Sometimes	Often	Always
6.	I feel scared when I have to take a test	Never	Sometimes	Often	Always
7.	I feel afraid if I have to use public toilets or bathrooms	Never	Sometimes	Often	Always
8.	I worry about being away from my parents	Never	Sometimes	Often	Always
9.	I feel afraid that I will make a fool of myself in front of people	Never	Sometimes	Often	Always
10.	I worry that I will do badly at my school work	Never	Sometimes	Often	Always
11.	I am popular amongst other kids my own age	Never	Sometimes	Often	Always
12.	I worry that something awful will happen to someone in my family	Never	Sometimes	Often	Always
13.	I suddenly feel as if I can't breathe when there is no reason for this	Never	Sometimes	Often	Always
14.	I have to keep checking that I have done things right (like the switch is off, or the door is locked)	Never	Sometimes	Often	Always
15.	I feel scared if I have to sleep on my own	Never	Sometimes	Often	Always
16.	I have trouble going to school in the mornings because I feel nervous or afraid	Never	Sometimes	Often	Always
17.	I am good at sports	Never	Sometimes	Often	Always
18.	I am scared of dogs	Never	Sometimes	Often	Always
19.	I can't seem to get bad or silly thoughts out of my head	Never	Sometimes	Often	Always
20.	When I have a problem, my heart beats really fast	Never	Sometimes	Often	Always
21.	I suddenly start to tremble or shake when there is no reason for this	Never	Sometimes	Often	Always
22.	I worry that something bad will happen to me	Never	Sometimes	Often	Always
23.	I am scared of going to the doctors or dentists	Never	Sometimes	Often	Always
24.	When I have a problem, I feel shaky	Never	Sometimes	Often	Always
25.	I am scared of being in high places or lifts (elevators)	Never	Sometimes	Often	Always

CODE: _ /___

26.	I am a good person	Never	Sometimes	Often	Always
27.	I have to think of special thoughts to stop bad things from happening (like numbers or words)	Never	Sometimes	Often	Always
28	I feel scared if I have to travel in the car, or on a Bus or a train	Never	Sometimes	Often	Always
29.	I worry what other people think of me	Never	Sometimes	Often	Always
30.	I am afraid of being in crowded places (like shopping centres, the movies, buses, busy playgrounds)	Never	Sometimes	Often	Always
31.	I feel happy	Never	Sometimes	Often	Always
32.	All of a sudden I feel really scared for no reason at all	Never	Sometimes	Often	Always
33.	I am scared of insects or spiders	Never	Sometimes	Often	Always
34.	I suddenly become dizzy or faint when there is no reason for this	Never	Sometimes	Often	Always
35.	I feel afraid if I have to talk in front of my class	Never	Sometimes	Often	Always
36.	My heart suddenly starts to beat too quickly for no reason	Never	Sometimes	Often	Always
37.	I worry that I will suddenly get a scared feeling when there is nothing to be afraid of	Never	Sometimes	Often	Always
38.	I like myself	Never	Sometimes	Often	Always
39.	I am afraid of being in small closed places, like tunnels or small rooms.	Never	Sometimes	Often	Always
40.	I have to do some things over and over again (like washing my hands, cleaning or putting things in a certain order)	Never	Sometimes	Often	Always
41.	I get bothered by bad or silly thoughts or pictures in my mind	Never	Sometimes	Often	Always
42.	I have to do some things in just the right way to stop bad things happening	Never	Sometimes	Often	Always
43.	I am proud of my school work	Never	Sometimes	Often	Always
44.	I would feel scared if I had to stay away from home overnight	Never	Sometimes	Often	Always
45.	Is there something else that you are really afraid of?	YES	NO		
	Please write down what it is_____				
	_____				
	_____				
	How often are you afraid of this thing?	Never	Sometimes	Often	Always

ROSENBERG SELF-ESTEEM SCALE

DATE.....

Please place a tick in the appropriate box to say whether you strongly agree, agree, disagree, or strongly disagree with the statements below.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. On the whole I am satisfied with myself				
2. At times I think I am no good at all				
3. I feel I have a number of good qualities				
4. I am able to do things as well as most other people				
5. I feel I do not have much to be proud of				
6. I certainly feel useless at times				
7. I feel that I am a person of worth at least on an equal plane with others				
8. I wish I could have more respect for myself				
9. All in all I am inclined to feel that I am a failure				
10. I take a positive attitude towards myself				

For Researcher Use Only
CODE: __/___

BAI®

NAME _____ **DATE** _____

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by each symptom during the PAST WEEK, INCLUDING TODAY, by placing an X in the corresponding space in the column next to each symptom.

	NOT AT ALL	MILDLY It did not bother me much.	MODERATELY It was very unpleasant, but I could stand it.	SEVERELY I could barely stand it.
1. Numbness or tingling.				
2. Feeling hot.				
3. Wobbliness in legs.				
4. Unable to relax.				
5. Fear of the worst happening.				
6. Dizzy or lightheaded.				
7. Heart pounding or racing.				
8. Unsteady.				
9. Terrified.				
10. Nervous.				
11. Feelings of choking.				
12. Hands trembling.				
13. Shaky.				
14. Fear of losing control.				
15. Difficulty breathing.				
16. Fear of dying.				
17. Scared.				
18. Indigestion or discomfort in abdomen.				
19. Faint.				
20. Face flushed.				
21. Sweating (not due to heat).				

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0154018422

BDI-II

Date:

Name: _____ Marital Status: _____ Age: _____ Sex: _____

Occupation: _____ Education: _____

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness

0 I do not feel sad.
1 I feel sad much of the time.
2 I am sad all the time.
3 I am so sad or unhappy that I can't stand it.

2. Pessimism

0 I am not discouraged about my future.
1 I feel more discouraged about my future than I used to be.
2 I do not expect things to work out for me.
3 I feel my future is hopeless and will only get worse.

3. Past Failure

0 I do not feel like a failure.
1 I have failed more than I should have.
2 As I look back, I see a lot of failures.
3 I feel I am a total failure as a person.

4. Loss of Pleasure

0 I get as much pleasure as I ever did from the things I enjoy.
1 I don't enjoy things as much as I used to.
2 I get very little pleasure from the things I used to enjoy.
3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings

0 I don't feel particularly guilty.
1 I feel guilty over many things I have done or should have done.
2 I feel quite guilty most of the time.
3 I feel guilty all of the time.

6. Punishment Feelings

0 I don't feel I am being punished.
1 I feel I may be punished.
2 I expect to be punished.
3 I feel I am being punished.

7. Self-Dislike

0 I feel the same about myself as ever.
1 I have lost confidence in myself.
2 I am disappointed in myself.
3 I dislike myself.

8. Self-Criticalness

0 I don't criticize or blame myself more than usual.
1 I am more critical of myself than I used to be.
2 I criticize myself for all of my faults.
3 I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes

0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.

10. Crying

0 I don't cry anymore than I used to.
1 I cry more than I used to.
2 I cry over every little thing.
3 I feel like crying, but I can't.

_____ Subtotal Page 1

Continued on Back

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11. Agitation

0 I am no more restless or wound up than usual.

1 I feel more restless or wound up than usual.

2 I am so restless or agitated that it's hard to stay still.

3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

0 I have not lost interest in other people or activities.

1 I am less interested in other people or things than before.

2 I have lost most of my interest in other people or things.

3 It's hard to get interested in anything.

13. Indecisiveness

0 I make decisions about as well as ever.

1 I find it more difficult to make decisions than usual.

2 I have much greater difficulty in making decisions than I used to.

3 I have trouble making any decisions.

14. Worthlessness

0 I do not feel I am worthless.

1 I don't consider myself as worthwhile and useful as I used to.

2 I feel more worthless as compared to other people.

3 I feel utterly worthless.

15. Loss of Energy

0 I have as much energy as ever.

1 I have less energy than I used to have.

2 I don't have enough energy to do very much.

3 I don't have enough energy to do anything.

16. Changes in Sleeping Pattern

0 I have not experienced any change in my sleeping pattern.

1a I sleep somewhat more than usual.

1b I sleep somewhat less than usual.

2a I sleep a lot more than usual.

2b I sleep a lot less than usual.

3a I sleep most of the day.

3b I wake up 1–2 hours early and can't get back to sleep.

17. Irritability

0 I am no more irritable than usual.

1 I am more irritable than usual.

2 I am much more irritable than usual.

3 I am irritable all the time.

18. Changes in Appetite

0 I have not experienced any change in my appetite.

1a My appetite is somewhat less than usual.

1b My appetite is somewhat greater than usual.

2a My appetite is much less than before.

2b My appetite is much greater than usual.

3a I have no appetite at all.

3b I crave food all the time.

19. Concentration Difficulty

0 I can concentrate as well as ever.

1 I can't concentrate as well as usual.

2 It's hard to keep my mind on anything for very long.

3 I find I can't concentrate on anything.

20. Tiredness or Fatigue

0 I am no more tired or fatigued than usual.

1 I get more tired or fatigued more easily than usual.

2 I am too tired or fatigued to do a lot of the things I used to do.

3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex

0 I have not noticed any recent change in my interest in sex.

1 I am less interested in sex than I used to be.

2 I am much less interested in sex now.

3 I have lost interest in sex completely.

22 23 24 25 26 27 28 29 30 A B C D E

_____ Subtotal Page 2

_____ Subtotal Page 1

_____ Total Score

Appendix 3

- Ethical Approval Letter
- NHS Lothian management approval letter

Lothian NHS Board

Deaconess House
148 Pleasance
Edinburgh
EH8 9RS
Telephone 0131 536 9000
Fax 0131 536 9009
www.nhslothian.scot.nhs.uk

11 AUG 2008

NHS Lothian

Lothian Local Research Ethics Committee 03
Deaconess House
148 Pleasance
Edinburgh
EH8 9RS

Telephone: 0131 536 9022
Facsimile: 0131 536 9346

01 August 2008

Miss Fionnuala Scullion
Clinical Psychologist in training
NHS Lothian
Paediatric Psychology & Liasion Service
Royal Hospital for Sick Children, 3 Rillbank Terrace
Edinburgh, EH9 1LL
EH9 1LL

Dear Miss Scullion

Full title of study: **Adolescents with Inflammatory Bowel Disease and/or Irritable Bowel Syndrome: An investigation into factors which affect psycho-social functioning and Health Related Quality of Life**

REC reference number: **08/S1103/32**

Thank you for your letter of July 2008, responding to the Committee's request for further information on the above research and submitting revised documentation, subject to the conditions specified below.

The further information was considered by the chair on behalf of LREC 3.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised.

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission at NHS sites ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements.

- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email referencegroup@nres.npsa.nhs.uk.

08/S1103/32	**Please quote this number on all correspondence**

With the Committee's best wishes for the success of this project

Yours sincerely

Chair

Email: joyce.clearie@lhb.scot.nhs.uk

Enclosures: "After ethical review – guidance for researchers" *[SL-AR1 for CTIMPs, SL- AR2 for other studies]*
Site approval form

Copy to: *Dr Tina McLelland*
[R&D office for NHS care organisation at lead site]

Guidance on applying for NHS permission is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	*Version*	*Date*
Application		27 June 2008
Investigator CV	CI	17 June 2008
Investigator CV	Various	
Protocol	6	23 July 2008
Covering Letter		17 June 2008
Letter from Sponsor		16 April 2008
Compensation Arrangements		20 July 2007
Questionnaire: Parental Bonding Instrument		
Questionnaire: Rosenberg Self Esteem Scale		
Questionnaire: PEDsQL Teens	4	
Questionnaire: PEDsQL Parent Report for Teens	4	
Questionnaire: Participant Information	3	02 June 2008
Questionnaire: PDI		
Questionnaire: PDI II		
Questionnaire: Spence Children's Anxiety Scale		
Letter of invitation to participant	3	23 July 2008
Participant Information Sheet: Parents	3	23 July 2008
Participant Information Sheet: Teenagers	6	23 July 2008
Participant Consent Form: Adolescent	4	11 June 2008
Participant Consent Form: Parent Guardian	4	11 June 2008
Response to Request for Further Information		23 August 2008
Univ of Edin letter		22 April 2008

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Now that you have completed the application process please visit the National Research Ethics Website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Progress and safety reports

Lothian Local Research Ethics Committee 03

LIST OF SITES WITH A FAVOURABLE ETHICAL OPINION

For all studies requiring site-specific assessment, this form is issued by the main REC to the Chief Investigator and sponsor with the favourable opinion letter and following subsequent notifications from site assessors. For issue 2 onwards, all sites with a favourable opinion are listed, adding the new sites approved.

REC reference number:	08/S1103/32	**Issue number:**	0	**Date of issue:**	01 August 2008
Chief Investigator:	Miss Fionnuala Scullion				
Full title of study:	Adolescents with Inflammatory Bowel Disease and/or Irritable Bowel Syndrome: An investigation into factors which affect psycho-social functioning and Health Related Quality of Life				

This study was given a favourable ethical opinion by Lothian Local Research Ethics Committee 03 on 15 July 2008. The favourable opinion is extended to each of the sites listed below. The research may commence at each NHS site when management approval from the relevant NHS care organisation has been confirmed.

Principal Investigator	*Post*	*Research site*	*Site assessor*	*Date of favourable opinion for this site*	*Notes [1]*
Miss Fionnuala Scullion	Clinical Psychologist in training	Royal Hospital for Sick Children, Edinburgh	Lothian Local Research Ethics Committee 03	01/08/2008	

Approved by the Chair on behalf of the REC:

..... (Signature of Chair/Co-ordinator)

(delete as applicable)

J C LEARIE ..... (Name)

University Hospitals Division
Queen's Medical Research Institute
47 Little France Crescent, Edinburgh, EH16 4TJ

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Email: R&DOffice@luht.scot.nhs.uk

Director: Professor Heather A Cubie

HACJB//approval/2f

07 July 2008

Miss Fionnuala Scullion
Paediatric Psycology and Liaison Service
Royal Hospital for Sick Children
3 Rillbank Terrace
Edinbrugh
EH9 1LF

14 JUL 2008

Dear Miss Scullion

MREC No:	**N/A**
CRF No:	**N/A**
LREC No:	**08/S1103/2**
R&D ID No:	**2008/C/PSY/02**
Title of Research	Adolescents with inflammatory bowel disease and/or irritable bowel syndrome: An investigation into factors which affect psycho-social functioning and health related quality of life
Protocol No/Acronym:	**Research Protocol V4 dated 17.06.2008**

The above project has undergone an assessment of risk to NHS Lothian and review of resource and financial implications. I am satisfied that all the necessary arrangements have been set in place and that all Departments contributing to the project have been informed. The documents reviewed are listed at the end of this letter.

I note that this is a single centre study and that Co-Sponsorship between the University of Edinburgh and NHS Lothian has been discussed and appropriate responsibilities agreed.

On behalf of the Chief Executive and Medical Director, I am happy to grant management approval from NHS Lothian to allow the project to commence, subject to the approval of the appropriate Research Ethics Committee(s) having also been obtained. You should note that any substantial amendments must be notified to the relevant Research Ethics Committee and to R&D Management with approval being granted from both before the amendments are made.

This letter of approval is your assurance that NHS Lothian is satisfied with this project. For approved research, NHS Lothian will provide cover for negligence for NHS and Honorary clinical staff for research associated with their clinical duties. It is not empowered to provide non-negligent indemnity cover for patients. Cover for healthy volunteer studies is the personal responsibility of both NHS and honorary employees and is usually arranged with a medical defence organisation or through the University of Edinburgh.

As Chief Investigator or local Principal Investigator, you should be fully committed to your responsibilities within the Research Governance Framework for Health and Community Care, an extract of which is attached to this letter.

List of Reviewed Documents

Document	Version	Date
Locked Nres Parts A&B Signed by Chief Investigator	AB/131115/1	27/06/2008
Locked Site-Specific Information Form signed by Principal Investigator	C/131115/212041/1	26/06/2008
Sponsorship Letter		16/04/2008
CV of Principal Investigator		
Protocol	V 4	17/06/2008
Information leaflet for teenagers	V 6	11/06/2008
Invitation letter	V 4	11/06/2008
Consent Form (Adolescents)	V 4	11/06/2008
Consent Form (Parent)	V 4	11/06/2008
Patient Information Sheet	V 3	02/06/2008
Research Patient Information Sheet	V 4	11/06/2008
Parent Report (Teenagers 13-18)	V 4	
Teenagers Report (13-18)	V 4	
Invitation letter	V 4	11/06/2008

Yours sincerely

Heather A Cubie

Professor Heather A Cubie
R&D Director

enc **Research Governance Certificate** ☑ **(to be signed and returned)**
Tissue Policy (if applicable) ☐
MTA (if applicable) ☐ **(to be signed and returned)**

cc ***Administrators, Research Ethics Committee***
Eddie Doyle, Clinical Director, RHSC

Appendix 4

- Skewness and Kurtosis *z*-scores
- Histograms of non-normally distributed variables
- Skewness and Kurtosis *z*-scores following transformations

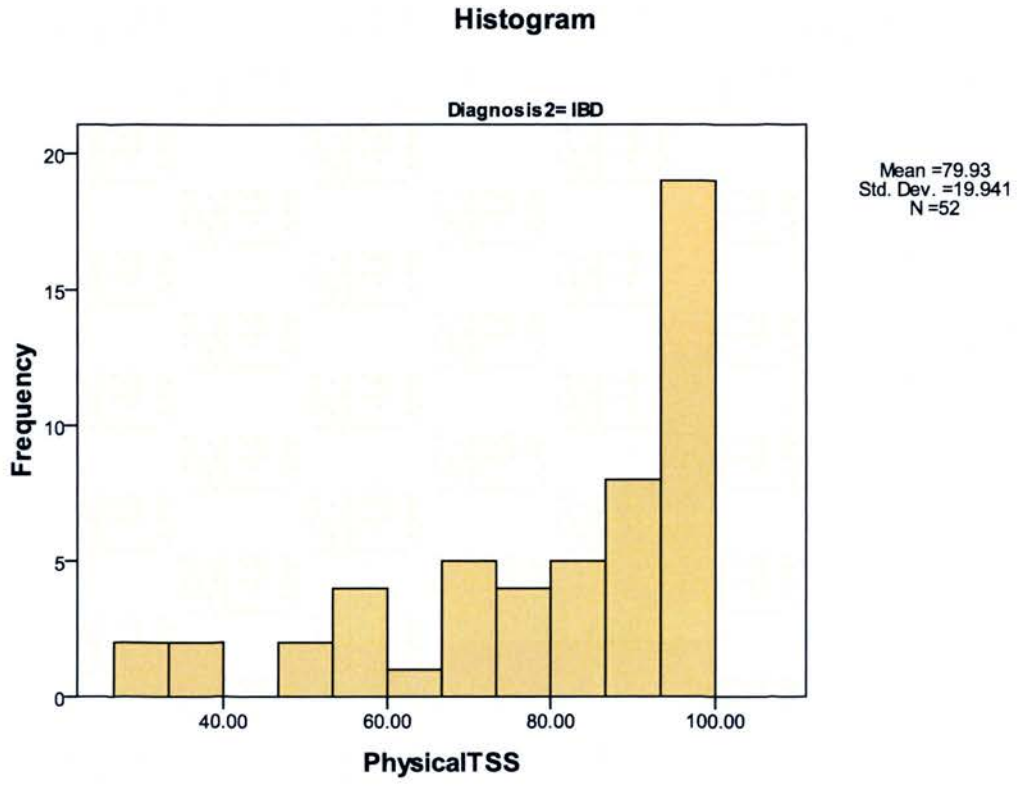
Skewness and Kurtosis *z* scores

Measure/Sub-scale	Skewness *z* score	Kurtosis *z* score
PedsQL Total Scaled Score (Teenager) (minus emotional scale)	-3.39*	0.44
PedsQL Total Scaled Score (Parent)	-1.22	-1.65
PedsQL Physical Scale (Teenager)	-3.63*	1.86
PedsQL Physical Scale (Parent)	-2.02	-0.42
PedsQL Social Scale (Teenager)	-4.01*	1.71
PedsQL Social Scale (Parent)	-2.75	0.42
PedsQL School Scale (Teenager)	1.31	-1.22
PedsQL School Scale (Parent)	-1.23	-1.19
PedsQL Emotion Scale (Teenager)	-2.49	0.74
PedsQL Emotion Scale (Parent)	0.24	-1.17
BDI-II (Teenager)	6.05*	6.92*
BDI-II (Parent)	2.00	-0.59
SCAS (Teenager)	4.52*	3.23
BAI (Parent)	3.13	0.84
RSES (Teenager)	-2.09	-0.22
PBI (Maternal Overprotection)	2.08	0.65
PBI (Paternal Overprotection)	0.96	-0.51

* *z* scores > 3.29 suggestive of violation of assumptions of normality (Field, 2005)

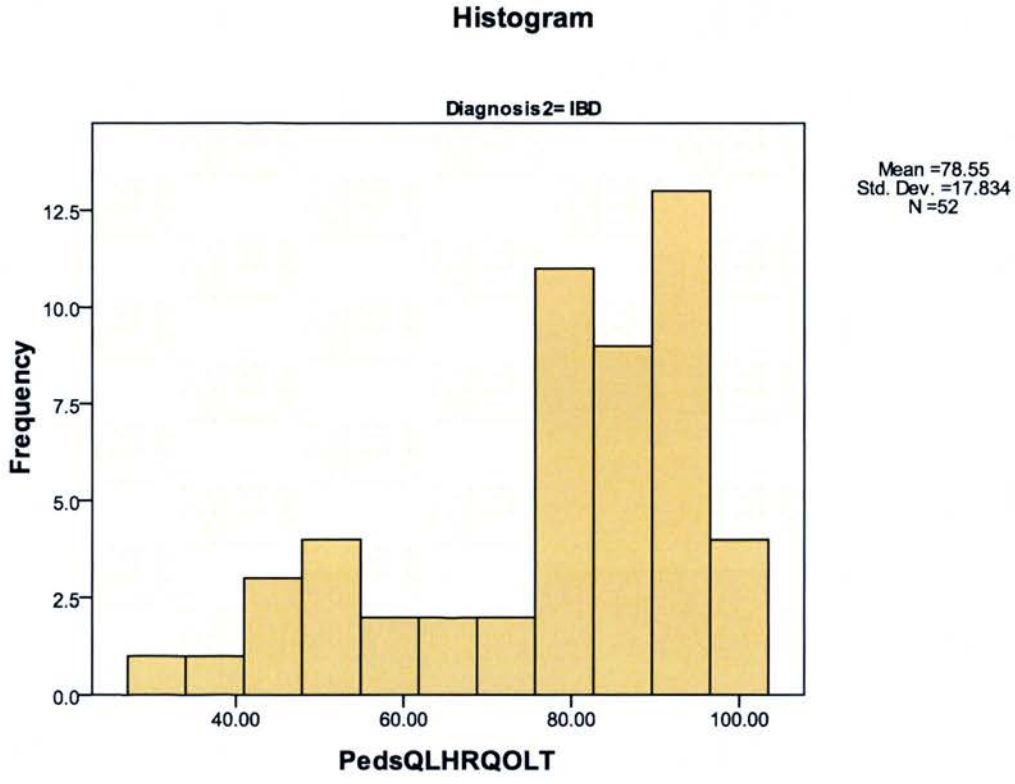
2. Histograms of non-normally distributed variables pre-transformation

1. PedsQL Physical Scale (Teenager)



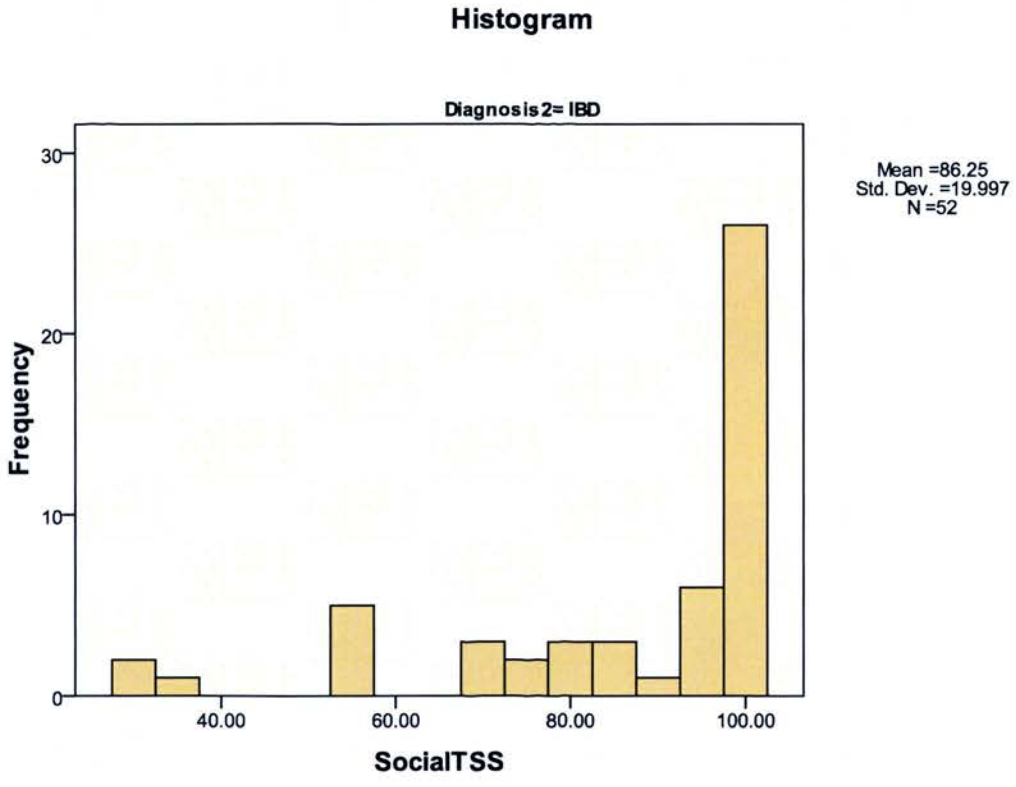
Suggested transformation – Reflect and logarithm (Tabachnik & Fidell, 1996)

2. PedsQL Total Scale (Teenagers) (omitting emotional subscale)



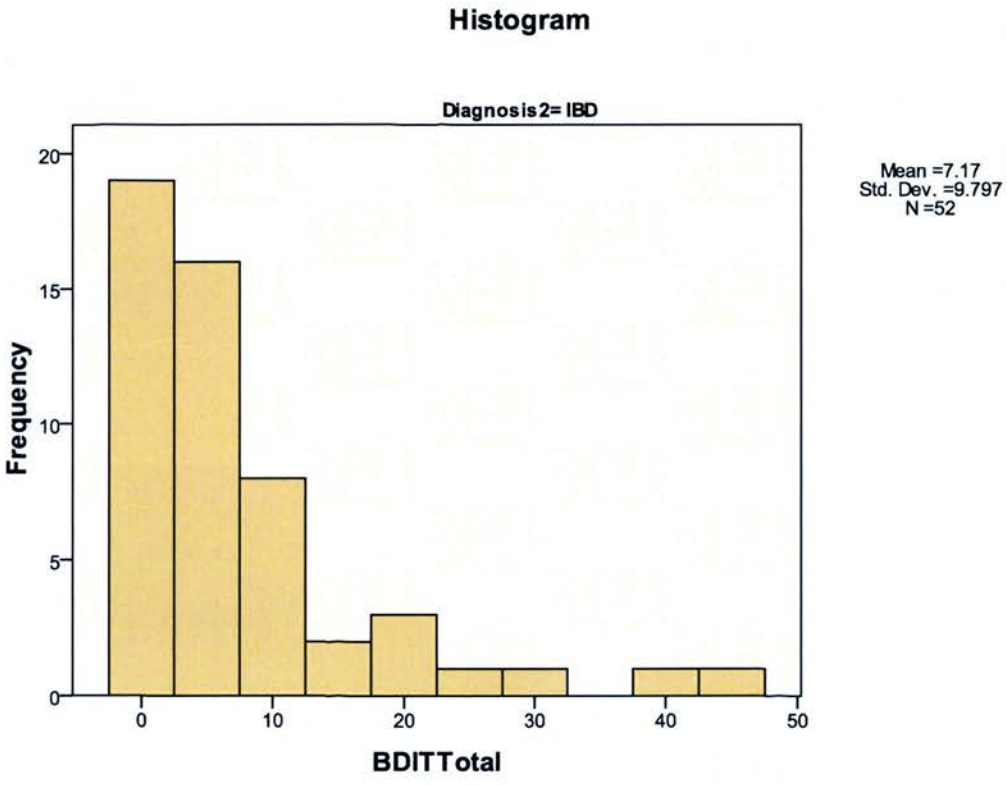
Suggested transformation – Reflect and logarithm (Tabachnik & Fidell, 1996)

3. PedsQL Social Scale (Teenager)



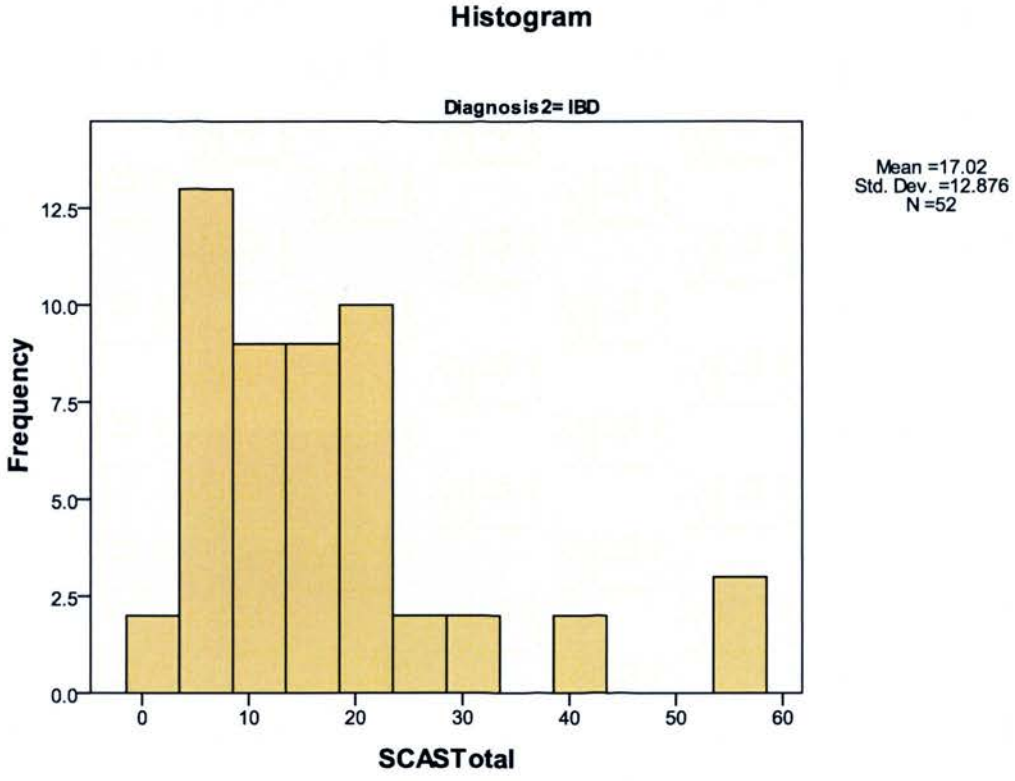
Suggested transformation – Reflect and logarithm LG10 (K-old variable) K=largest value possible minus 1(Tabachnik & Fidell, 1996)

4. BDI-II (Teenager)



Suggested transformation: Logarithm LG10 (old variable) (Tabachnik & Fidell, 1996)

5. SCAS (Teenager)



Suggested transformation: Square root: new variable = SQRT (old variable)

3. Skewness and Kurtosis *z* scores following transformations

Measure/Sub-scale	Skewness *z* score	Kurtosis *z* score
PedsQL Physical Scale (Teenager)	-2.20	0.79
PedsQL Total Scaled Score (omitting emotional sub-scale)	-1.27	-0.38
PedsQL Social Scale (Teenager)	1.38	-2.40
BDI-II (Teenager)	0.30	-0.48
SCAS (Teenager)	2.39	0.2

NB – All transformed *z* scores below the cut-off of 3.29 (Field 2005).